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RECENT RESEARCH AND VITAMINS.

By W. B. S. BISHOP, M.Sc., A.A.C.I.,
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PROFESSOR H. E. ARMSTRONG in a recent article drew attention to the great progress recently made in our knowledge of the vitamins. It is thought that a more detailed survey of the work in this field will be of interest to many readers who have not the time to consult the literature. It is proposed to discuss the literature in two sections: (i) dealing with irradiated ergosterol and vitamin *D*, and (ii) dealing with carotene and vitamin *A*. Further, owing to the size of the literature that has grown up around these two subjects, it is proposed to limit the details of this survey in the main to work achieved last year. Even then the review will not be complete.

Irradiated Ergosterol and Vitamin D.

It will probably be remembered that Wendaus and Hess and Rosenheim and Webster successfully showed that when certain material (for example, ergosterol) is submitted to ultra-violet irradiation, an active substance with antirhachitic properties is formed. They also claimed that ergosterol is the precursor of the substance vitamin *D*, and since then many efforts have been made to isolate vitamin *D* from irradiated ergosterol in a chemically pure state. Recently crystalline products of great potency have been obtained; but owing to many physical discrepancies in individual preparations, one cannot say whether or not the pure vitamin has been isolated.

All the workers in this field appear to agree that successful radiation can take place only in the absence of oxygen, but the attainment of the exact optimum conditions presents great difficulties. Thus it is now recognized that the time of radiation is

important, since ultra-violet light itself destroys the vitamin. In fact, two physiologically inactive crystalline isomerides of ergosterol have been isolated from over-radiated ergosterol (Windaus, Gaede, Koser and Stein). These have been named "Suprasterol I" and "II".

As to the efficiency of the different wave lengths in the radiations used, there seems to be little agreement. Normal light has no action on ergosterol; although some photochemical reactions have been recorded when chlorophyll or other fluorescent compound was used, the products have no physiological activity. There thus appear to be two schools, those favouring the use of rays of wave length greater than 284 micromillimetres ("long waves"), and those who use "short waves" of 254 to 284 micromillimetres. When long waves are used, it is considered that the products of irradiation are limited to the conversion of ergosterol into only one other substance, called "L", which is supposed to be identical with vitamin *D*. With short waves the process is complicated, two substances being formed, one of which is "L"; the other is referred to as "S". Results confirming this work have been reported by Askew, Bourdillon, Bruce, Jenkins and Webster. On the other hand, Windaus, Luttrenghaus and Deppe were unable to confirm the results regarding the effects of long and short waves.

The first crystalline product was made by Reerink and Van Wijk, but many significant omissions appear in their papers. It is stated, however, that a preparation from ergosterol in ether, radiated until 25% transformation occurs (as judged by change in optical rotation) and still containing 3·7% ergosterol, has a melting point of 115° to 117° C. and a dextro-rotation (corrected for ergosterol content) of 100° when a sodium light was used (expressed thus: m.p. 115° to 117° C. and $[\alpha]_D + 100°$). A preparation of rotation $[\alpha]_D + 68·1°$ showed on standing a rise in rotation to $[\alpha]_D + 94°$ after twenty days. A preparation containing 50% ergosterol cured rats of rickets in fourteen days, in daily doses of 0·00001 milligramme.

The next preparation of a crystalline product was reported by Askew *et alii*; but the authors were themselves doubtful of the purity of their product. Angus, Askew *et alii* improved the process and obtained in larger quantities a very potent product. Two peculiarities in their process are worthy of note. In the first place, Askew *et alii* had confirmed the previous findings regarding the action of short and long wave length radiation on ergosterol, but now use unscreened radiation. Secondly, they used distillation to purify their product, which, from Reerink's and Van Wijk's experiences, would effect considerable physical, if not physiological, changes in the properties of their product. The yield of potent crystalline product was 17%. This had a melting point of 123° to 125° C., and, in solution in 99% alcohol, at a temperature of 20° C., when a light with a wave length of 5,461 Ångström units was used, had a specific dextro-rotation of 260° (expressed thus: m.p. 123° to 125° C. and $[\alpha]^{20}_{5461}$ 260°). The substance was stable *in vacuo* or in dry air for two months. The antirhachitic activity in Medical Research Council units was 20,000. They have called their product "calciferol". Later these authors state that they have separated the above-mentioned crystalline product into two fractions, isomerides, called calciferol and pyrocalciferol, this calciferol having an activity of 40,000 Medical Research Council units.

Windaus, Lüttringhaus and Deppe have also produced a crystalline product, which they later examined, to gain some idea of its structure, following a report of Diels and Adler that maleic and citraconic anhydrides formed additive compounds with systems containing conjugated double linkages. Windaus *et alii* report that their crystalline product fell into a group which reacted slowly at 80° C. with the anhydrides: the crystalline product of m.p. 124° to 125° C. and $[\alpha]_D^{20} + 140·5°$ and $[\alpha]^{20}_{5461}$ 171° in acetone or alcohol, they called vitamin *D*, because the evidence indicated the presence of more than one substance of antirhachitic properties.

Windaus *et alii* also concluded that the active substance in the product obtained by irradiating ergosterol with unfiltered ultra-violet light, contained less vitamin *D* than that prepared with long waves, even though the two preparations had about the same activity. They considered, therefore, that the former preparation contained a second vitamin, and in a further note to their paper, state that a compound vitamin D_2 has been isolated by O. Linsert, and has m.p. 114° to 115° C. and $[\alpha]_D$ 85° in acetone. The position at present is that four crystalline antirhachitic preparations have been obtained, namely, the substance *L* of Reerink and Van Wijk, calciferol and vitamins D_1 and D_2. It has yet to be decided what relationship exists between them. Without going into the available evidence in any detail we may say that, with the exception of vitamin D_2, for which no data are available, they are all isomerides or mixtures of isomerides of ergosterol. The published figures in the papers quoted suggest that there are not more than two different substances amongst the four crystalline preparations. The evidence given suggests that vitamin *D* and calciferol are both pure substances, but different isomeric compounds. Vitamin D_2 is probably identical with calciferol. With regard to the substance *L*, the position is complicated. It is extremely unstable in the presence of oxygen (quite different from both calciferol and vitamin D_1) and appears to be either calciferol or vitamin D_1 with much impurity, which catalyses the oxidative reaction and is also responsible for other changes, or else it is a primary irradiation product of ergosterol. It is not possible at present to give a more definite statement regarding the relationship of these four compounds.

Carotene and Vitamin A.

There has been a vast amount of research made during the past few years on the vitamin *A* activity

of carotene. Thus it is now definitely established that carotene can act as a substitute for vitamin *A*. The association of vitamin *A* with the lipochrome pigments was observed at an early date in the investigation of this vitamin. Evidence was soon forthcoming that the content of lipochrome pigments and vitamin *A* in fats and oils did not run parallel, which suggested that the association of the two substances was fortuitous. Some authors showed that certain foodstuffs retained their vitamin *A* activity after removal of all carotene pigments, while the absence of any relationship appeared proven by the work of Drummond, Channon and Coward, who found that neither purified carotene nor lycopin possessed any growth-promoting activity.

Some careful work by T. Moore, in which rats were maintained on a diet in which carotene was the sole source of vitamin *A*, showed the presence of vitamin *A* in the liver oils of the rats. Not only was it shown that vitamin *A* was present in these oils, but that carotene was absent. This was shown by chemical and biological tests. Further confirmation of this work has been made by several workers, among whom may be mentioned Ahmad and Rydbom.

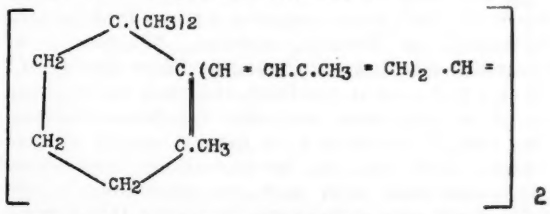
The view that carotene is transformed in the liver to vitamin *A* is now generally accepted; but the recently advanced claim of Olcott and McCann, that this can be done *in vitro*, is quite new. It is stated that when carotene was digested at 38° C. in a medium with a hydrogen ion value of 7·45, with the ground liver of a rat which had been kept on a diet deficient in vitamin *A*, the pigment disappeared almost entirely; simultaneously a new unsaponifiable ether-soluble substance was produced, which showed an absorption curve with a band at 328 micromillimetres. These authors conclude that an enzyme, called by them "carotenase", is present in the liver and causes the conversion of carotene to vitamin *A*. This idea does not appear tenable alongside the generally accepted view that carotene is the precursor of vitamin *A*.

It is even now suggested that carotene is not a single substance, but a mixture of two isomeric hydrocarbons. This result was obtained quite independently by Kuha and Lederer, and by Karrer, Helfenstein, Wehrli, Puper and Morf. The latter authors state that they had had indications that this was the case from some earlier work of Willstätter, and later of themselves, in which samples of carotene were prepared which had widely different melting points. However, it was a study of the optical rotation of carotene which finally confirmed the view that two isomerides are present. These isomerides, called α-carotene and β-carotene respectively, were shown to have a rotation in benzene of 380° and ± 0° respectively, with a cadmium light, at 20° C. ($[\alpha]^{20}_{cd}$ + 380° and $[\alpha]^{20}_{cd}$ ± 0°). In view of the fact that the β-isomeride is the more easily separated, it appears most probable that it was the substance used by Euler, Karrer, and Rydbom in their original experiments which established the activity of carotene. The isolation of α-carotene is difficult, but Kuhn and Brockmann have found a convenient method. This depends upon the fact that β-carotene is more easily absorbed in Fuller's earth from benzene or light petroleum solutions than is the α-isomeride.

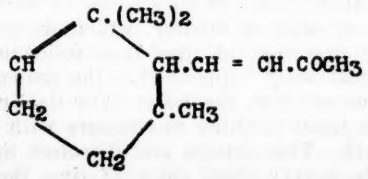
The activity of the α carotene has been found to be of the same order as the β-carotene, 0·005 milligramme producing good growth in rats. It was also found that the β-carotene produces its effect more rapidly than the α compound; thus the β-carotene reacts in two days, the α compound requiring seven days. Since, however, the α-carotene contained about 60% of β-carotene, as determined from its optical rotation by Kuhn and Brockmann, the results require confirmation.

Of chemical interest is the work of J. H. C. Smith, who showed that when carotene is treated with aluminium amalgam, dehydrocarotene is produced, which, it is stated, possesses growth activity.

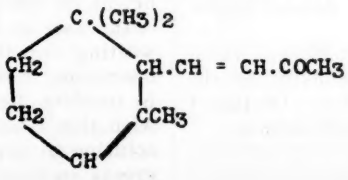
Of great interest chemically is the work dealing with the structural formula suggested for carotene by Karrer, Helfenstein, Wehrli and Wettstein. Further confirmation has been given by the experiments of Pummerer *et alii*. In brief, it is claimed that carotene may be considered to be derived from phytol or phytol aldehyde by condensation, followed by dehydrogenation and ring closure, resulting in the structure expressed as follows:



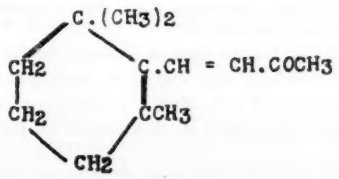
which is the formula suggested for β-carotene. This formula does not permit of optical activity, although Karrer *et alii* point out that the ring closure is analogous to that taking place in the formation of ionone from ψ-ionone (1), which proceeds in two ways, as is well known, yielding α-ionone (2) and β-ionone (3).



(1) ψ-Ionone.



(2) α-Ionone.



(3) β-Ionone.

The ring in β-ionone corresponds with that given for β-carotene, while in α-ionone we have an asymmetrical carbon atom; this would explain the optical activity of carotene, if this ring system is present. Alternative formulæ have been proposed and discussed, but the presence of α-ionone and β-ionone ring systems appears to be generally accepted at present as part of the structural formulæ.

In conclusion it may be mentioned that Karrer and Helfenstein have shown that squalene, a hydrocarbon present in some fish liver oils, has a symmetrical formula (4), which, it will be seen, is related to those of lycopin and carotene.

$$[C.[CH_3]_2 = CH.CH_2\ CH_2\ CCH_3 = CH.CH_2.CH_2.C(CH_3) = CHCH_2]_2$$

(4) Squalene.

This formula has been confirmed by synthesis by Karrer and Helfenstein by heating farnesyl bromide with metallic potassium or magnesium.

From the foregoing it will be seen that considerable progress has been made in the chemistry of vitamins *A* and *D*; in fact, so exact has this work now become, that these two vitamins at least come into the province of pure chemistry.

RANDOM THOUGHTS ON SINUS INFECTION.[1]

By HUBERT M. JAY, M.B., B.S. (Adelaide), F.R.A.C.S.,
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As you all know well the difficulty in deciding on a subject for a paper to be read at these meetings, I have no doubt that you will forgive me if I break away from traditional procedure in my selection tonight.

In the issue of *The British Medical Journal* of March 21, 1931, there appeared a paper by Professor Goldsmith, of Toronto, entitled: "Treatment of Paranasal Suppuration Persisting After Operation." After I had read it carefully, it struck me as being so full of suggestion and ideas capable of elaboration that I determined to take it as my subject tonight, pick out the interesting or contentious parts, and deal with each one separately in the light of my own experience. In doing this I trust that you will not consider me presumptuous if I do not always agree with such an eminent writer.

The Persistence of Discharge After Operation.

The first sentence with which I propose to deal is the following:

> Persistence of discharge from any nasal accessory sinus following operation does not necessarily demand further surgical measures.

This I consider is a very important dictum which we should do well to remember; convincing the patient of its truth is another matter. Of this I shall say more in dealing with the next extract.

[1] Read at a meeting of the Eye and Ear Section of the South Australian Branch of the British Medical Association on June 2, 1931.

What we have to remember is that occasionally it is apparently impossible entirely to cure a patient of sinus suppuration. There is some residual discharge, purulent or muco-purulent, and the surgeon is left to argue matters out with himself along these lines:

1. Have I done all that is necessary? Have I left an infected sinus undrained or unaerated?
2. Have I done the right operation? Should I have done a radical antrum operation instead of an antrostomy, an external frontal or ethmoid operation in place of an internal drainage?
3. Is there some accessory factor complicating matters?

These are questions which can be decided only by experience and the exercise of considerable judgement. The third question is sometimes very difficult to answer, and to my mind the cases in which there is some complicating factor provide the greatest number of failures. The group includes such factors as the presence of a foreign body or an abscessed tooth discharging into the antrum; but the cause *par excellence* of trouble is the existence of that curious and extremely baffling condition which we know as allergy. Should desensitization of these patients prove to be impossible (as it frequently is in my experience), then I frankly confess that I do not know what to do for them beyond keeping pegging away and using astringent sprays or zinc ionization.

The first and second questions should, I think, be answered first on a "wait and see" basis. Some supplementary treatment should be given if no progress is being made (for example, "Argyrol" drops or zinc ionization). In this connexion it is well to note that not all polypoid buds occurring a few weeks after an extensive intranasal operation need removal. They frequently disappear with the use of "Argyrol" in the nose. Should an antral polypus block an antrostomy or become extruded into the nose, it must be regarded as an indication that the radical operation is necessary before the process is likely to clear up, though even this procedure may fail to produce complete relief in an allergic subject.

I can point to numerous instances, chiefly of frontal sinus involvement, that seemed to demand further interference, but for some reason or other operation was postponed and the patient drifted away, only to come back years after and report that nothing further had been done and that no trouble had occurred in the interim. In many cases the mere aeration of the nose, brought about by the procedures adopted at the initial operation, is sufficient to bring about relief or cure.

In cases of long delay in healing, whilst we are waiting for the cessation of discharge following operation, it occasionally happens that the patient is troubled by crusting in the nose. For dealing with this I have found nothing to compare with a solution of pepsin. This loosens and dissolves the crusts so that in a very short space of time they cease to cause inconvenience.

The Type of Patient.

The type of patient is of importance in determining the most satisfactory treatment in an individual instance.

We all know that patients fall roughly into three classes:

1. The patient who expects what he calls a complete cure, that is, the relief of all symptoms which he (not the surgeon) regards as abnormal.

2. The reasonable patient who recognizes that, having had a (possibly) severe operation on an extremely sensitive and functionally delicate organ, he must not expect to have quite such an efficient nose as one that has never been afflicted with disease severe enough to give rise to gross structural changes.

3. The extremely tolerant person who is grateful for the fact that he can breathe through his nose, even if he still has some post-nasal dropping.

Now it is not always possible to tell into which class any patient is going to fall, and for this reason I believe that, whatever we may hope for, we should not convey to the patient an idea of the absolute infallibility of operative treatment. At the same time, we must avoid the suggestion that operation presents only an outside chance of cure. It is my rule in these cases, when patients ask for an accurate forecast of events after operation, to say to them: "I am going to operate on you because I know that in operation lies your greatest hope of cure. I am confident that I can cure you, or at any rate put your nasal passages in such a condition that the symptoms of which you complain will cease to worry you to any appreciable extent; but if you ask me to guarantee a cure, then I must refuse to proceed." It is quite exceptional for anyone to fail to recognize the justice of this, and on the whole I think it increases rather than lessens the patient's confidence.

I have dwelt on this at some length because, if the position is clearly put before the patient prior to operation, it modifies the situation considerably when one comes to deal with a patient who complains subsequently that he still has some nasal discharge or post-nasal dropping. The surgeon is then left with the task of determining whether the complaint is justified or not (as is often the case with neurotics) and of dealing with the situation accordingly.

The Significance of Discharge After Operation.

The next sentence in Professor Goldsmith's paper to catch my eye was the following:

We will not allow ourselves or the patient to become unduly alarmed by the continuation of some muco-purulent nasal discharge.

I think that there is nothing in the article under review which deserves more prominence than this sentence. I believe that we should instruct the patient in this matter and say to him: "Here we have a cavity, the lining of which has been altered by disease. The cavity has been drained and the way opened up for Nature to effect a cure. It will be weeks, probably months, before this comes about, and in the meantime you must expect a little trouble." As one well known laryngologist (I think it was A. J. Wright) remarked during an address on this subject, "time is the essence of the contract". It is well that the patient should understand this, and even more important that the surgeon should not forget it.

The Frontal Sinuses.

In dealing with the frontal sinus Goldsmith says, *à propos* of permanent intranasal drainage to be established during the course of an external operation:

My greatest difficulty is to keep this from closing over.

This is indeed the crux of the position, and during the time that I followed the classical procedures I, like everyone else, was frequently in trouble over it. However, since following the method advocated by R. S. Godsall, of treating the wound by the open method and securing the complete obliteration of the cavity, I have had no worry over this point. I am convinced that it is the only really satisfactory method that I have ever come across, and cannot recommend it too strongly. The cavity being obliterated, the necessity for permanent drainage no longer exists.

The Sphenoidal Sinus.

Professor Goldsmith's remarks on the sphenoidal sinus contain the following words:

The preliminary operative work on the posterior part of the septum and posterior part of the ethmoidal wedge *et cetera*.

I am constantly struck by the fact that many infected sphenoids escape operation. I do not know whether this is always due to uncertainty of diagnosis or a mistaken idea as to the inaccessibility of the sinus, but the fact remains that sphenoidal infection is common and its drainage rare, hence the significance of the remark quoted above.

Once the septum is resected and the lower half of the middle turbinate removed by scissors or shears, the sphenoidal sinus becomes as accessible as any other sinus. This is a point worth remembering, as I feel sure that an undrained sphenoid is frequently the cause of the continuance of symptoms following operation on the more anterior sinuses.

Would it be out of place to remark at this stage that I resect the septum during operation on any of the sinuses far more often than not? I am a firm believer in doing this wherever there is the slightest excuse for it, as I am sure that the subsequent aeration and drainage of the nose is of the greatest value in restoring the diseased parts to a state of health.

The Maxillary Antrum.

In the section devoted to consideration of the maxillary antrum there occurs the following sentence:

It is advisable in all cases, I feel sure, to remove the anterior one-third of the inferior turbinate.

I should like to hear what other members of this section have to say on this point, as it appears to

me to be highly debatable. For years I used to follow the procedure advocated, but encountered so many hypertrophied stumps of turbinates and closed antrostomies that I abandoned it long ago and have never had cause to regret my action. Also, of late years, I have taken to making my antrostomy as far back as possible and not encroaching so much on the anterior portion of the antro-nasal wall. I find that this gives rise to less tendency to closure and less pain, and, of course, it does away with any possible indication for removal of the anterior portion of the turbinate. One of the reasons given in the paper against the preservation of the turbinate tissue, namely, that it "prevents the patient washing out the antrum", does not apply in my case, as none of my patients washes out his antrum as part of the after-treatment. I prefer to keep the cavity as dry as possible, and employ suction to remove any accumulated fluid. This is not performed through the medium of a cannula introduced into the antrum, but by means of an olive-shaped nozzle which fits into the nares, the suction being brought to bear on the whole extent of the nasal cavities.

In considering this subject Goldsmith, later on in his paper, states that "persistent and forcible douching of the antrum following operation delays the healing and regenerative process *et cetera*". Why he should stress the "persistent and forcible" I cannot see, as it is inconceivable that so much force should be used as to damage the new cells. Surely it is the continual bogginess induced, the bathing in an abnormal fluid, and the washing away of the protective and antiseptic mucus that do the damage in douching.

Ethmoidal Disease.

Speaking of ethmoidal disease, Goldsmith says:

> When I have decided to remove all the ethmoidal cells I am able to reach safely through the nose, I prefer to proceed in stages and allow sufficient time to elapse between such operations, so that most of the inflammatory œdema has had time to subside. I can then orient myself much better and follow the discharge more directly to its source.

This surely seems more sane advice than that given in the descriptions of "complete exenterations". Nevertheless it is possible to do a great deal with safety by using a pair of Luc's forceps and a long-bladed Killian speculum, and I find as the years go by that the cleaning-up process following the original operation is becoming less and less necessary.

In discussing this form of sinus infection, attention is drawn to Logan Turner's work on the passage of infection along the nerve sheaths of the region. Does this possibility constitute a real danger to the rhinologist? I do not think it can be so or we should see more of it. I have never seen a case.[1] I should like to hear the experience of others regarding this.

[1] Since writing this paper one of my patients developed a meningitis subsequent to operation. This may have been a case of infection along the nerve sheaths.

Goldsmith's paper closes with a note on access to the ethmoid, and emphasizes what I have already drawn attention to, namely, the desirability of septal resection in practically every case. If this were done more often, I feel confident that we should not have so many patients with symptoms persisting to a greater or less degree after operation. This, after all, is the aim of the surgeon. Why deprive the patient of the benefit of it for an extra ten minutes? Others have said to me: "You are doing too much at one time", "the nose will be too obstructed by reaction following operation" *et cetera*. I do not think so. I never pack a nose after a sinus or septum operation, except in the presence of persistent hæmorrhage, and I find that if a puncture is made through one of the septal flaps posteriorly to allow drainage of the blood from between them, there is practically no blocking. It is worth your serious consideration.

THE OPERATIVE TREATMENT OF SQUINT.

By BRIAN MOORE, M.B., B.S. (Adelaide),
Adelaide.

THIS paper should have been entitled "The Treatment by Operation of Concomitant Squint", as I am making no attempt to discuss the paralytic type. In a short paper it is impossible to go as fully as one should into detail, and if the substance is scanty, I hope there is sufficient of it to promote criticism and discussion, both of which I hope will be frank and free.

My remarks have been written with a view to concentrating on the convergent type of squint, and if no special mention is made to the contrary, it can be assumed that this is the variety meant. I have made no attempt to discuss the treatment of concomitant squint from any other point of view. This would make the subject matter much too extensive.

Indications and Contraindications.

We all agree, I think, that operation should be reserved for those cases in which other treatment has been tried and has failed. Operation, naturally, should be our last resort. There is so much apparent difference of opinion, however, on what is a suitable case for operation, and also on what is the proper operation to use, and especially on the proper age at which operation should be performed, that it seemed worth while to state my own ideas and facts bearing on the subject and ask for your opinion on them.

Squint is an exceedingly common condition in children. Somewhere about 6% of the total ophthalmic out-patients at the Children's Hospital, Adelaide, are brought because of this disability. The majority of the patients respond to proper treatment, but there always remain a number who make no progress towards lessening the angle of

their deviation. Most of these latter undoubtedly present themselves too late for treatment. Unfortunately, the legend that squint is due to teething or some other purely physiological condition dies hard, and the pernicious teaching that the parents should wait and see if the squint will go at the age of two, seven or fourteen years, or some other mystical age, is not only supported by the lay public, but, sad to relate, by some members of the medical profession. There still remain a number of patients who, from possibly very large deviations or some other cause, do not respond to what one might call "medical treatment".

To the lay mind, and to others, squint, not being a matter of vital importance and not being accompanied by pain or any distress, is, I think, apt to be treated lightly. Apart from the loss of binocular vision to a patient who is not cured young, the mental stress of a child who goes "cock-eyed" through school, at the mercy of his sharp-tongued companions, is undoubtedly worthy of consideration.

We are faced first, then, with the necessity of deciding that a particular patient is not making progress. The only possible method of decision is by actual measurement of the angle at stated intervals and under the same conditions. To take this measurement various devices have been used, each one satisfactory in its way. My own machine is a copy of the "deviometer" described by Worth in his book. It was very easy to make and is very easy to use. The method I adopt is to measure the angle at the first consultation. Refraction follows, and glasses are ordered if necessary, through which the angle is measured again after the effect of the atropine has disappeared. Suitable fusion training is adopted or attempted and the angle measured again in six months' time through the glasses. This treatment is continued and the patient seen at intervals of six months. When two visits have passed without any lessening of the deviation, I conclude that further improvement is not likely to take place. It is then, provided there is no contraindication, that operation is thought of.

The age of the patient has now to be considered, and here I confess I should like the opinion of those who have had a longer experience than myself to guide them. To wait, as I was taught some time ago, till the child is fourteen years of age before operating, seems to me to be missing the two most important points: first, the attainment of binocular vision, secondly, a normal appearance during school days. The development of binocular vision is most active up to the age of six years, and the possibility of attaining it declines rapidly after this age. Strictly speaking, operation should be followed by the best results in these earlier years. I have operated on these young children and confess in my zeal to have operated on one as young as four years; but the difficulties of nursing are so great that I should not like to repeat the experience. I have come to the conclusion that six is about the earliest possible age at which any cooperation can be obtained from the patient, and this is roughly the earliest age at which I advise operation. Even then I confine myself to patients with a fair prospect of achieving binocular vision, who have large deviations that have been under treatment since infancy, with good vision in each eye. I think if advanced amblyopia is present one should prolong the ordinary treatment until the child is older, say, eight or nine years. Fourteen is, I consider, unnecessarily old in any case. Extreme youth, I think, therefore, is the first contraindication. The second contraindication that occurs to me is the existence of little or no visual power in the squinting eye, due to some developmental or acquired abnormality apart from errors of refraction. In these cases I do not think satisfactory results are obtained. It must be remembered that in a concomitant squint, even if the central vision is very defective, the peripheral vision remains practically unchanged; this is probably not so in a damaged or congenitally malformed eye.

Nystagmus, which is present in some children with high degrees of refractive error, I do not think is any bar to operation. I have operated on two patients suffering from this condition and found no discomfort afterwards; in fact there was a definite lessening of the obvious excursion, particularly in the eye subjected to operation, and better fixation after the eyes were straight.

In the young adult or the mature person with a squint the operation becomes one for cosmetic purposes only, and the difficulty of deciding for or against it are much less and are mostly governed by the patient's wishes. Most of these patients have practically no simultaneous macular perception. Some seem to have kept more than a remnant of it. If simultaneous macular perception is good, I do not like taking the risk of operating. Here again I should appreciate the opinions of others.

There are several ways, of course, of testing for the presence of simultaneous macular perception; one that appears rational to me is actually to put the deviating eye into correct alignment and to observe the result. This can easily be done with the assistance of cocaine and a pair of fixation forceps. Marked diplopia when the eyes are straight shows the presence of persistent binocular vision. I also would hesitate to advise operation on an adult suffering from nystagmus. My objection is based on one case that I saw in London; after the operation, which was a success mechanically, the patient became aware of the movement and referred it to objects in the outside world. Eventually the result had to be undone, with some difficulty.

Such contraindication as poor health of the patient or unhealthy conditions of the lids or lachrymal sac would, of course, not be overlooked by any careful surgeon.

The Type of Operation.

When one has decided that an operation is indicated, the next question is of what type the operation shall be.

Apparently the first operation for squint was done in 1839 by a German called Dieffenbach, on a boy, aged seven years. From the description, the operation consisted in division of the internal rectus through the muscle fibres; it was followed by a perfect result. It was hailed as a triumph of surgery, and tenotomy or myotomy, as it was called indiscriminately, was practised widely; in fact, in those days the cry appeared to be: "Here is a squint, come, let us cut it." All manner of variation of the operation was invented, and it seems that the amount of correction hoped for was varied with the distance away from the globe that the muscle was severed. However, some cases of overcorrection must have resulted, for it was only three years later that the originator of the method introduced a suture to limit the result of the tenotomy. It was not very long after this that the first advancement was performed, and Critchett performed an operation in which both internal recti were advanced with a favourable result. He published a report of the case in 1858.

Nowadays tenotomy has fallen somewhat into disrepute, and it is curious to refer to these earlier times, when it was the only operation used.

Widely speaking, we have three methods which may be applied: retirement or tenotomy alone, advancement alone, or a combination of the two.

Retirement alone is usually performed as a preliminary to a subsequent advancement operation, and is applied mostly to large deviations. Tenotomy alone is so seldom done as to be hardly worth mention. Advancement alone appears the most surgically sound procedure, but in my opinion is not easy as a means to overcome large deviations; in fact, if one considers the mechanism of the ocular muscles, it seems reasonable to allow some slackening off of the pull of a strong internal rectus before or during the time that the external rectus is being advanced. "Tackle the strong muscle first" has always appealed to me as good reasoning, except in very low degrees of squint.

There is a very decided opinion against the combined tenotomy and advancement operation. Meller, in his book on ophthalmic surgery, says: "Incalculable and undesirable results may follow simultaneous advancement of the *rectus externus* and tenotomy of the *rectus internus* of one eye." He goes on to say that it can be recommended only for the highest grades of convergent strabismus and that even in these cases the muscle should be shortened only and not advanced. With this opinion I have the temerity to disagree, provided the tenotomy is properly done, by which I mean that the tendon is not picked up on a hook and divided blindly, but that its insertion is isolated, a buttonhole made in the centre and the fibres divided laterally till only the most lateral fibres and the lateral expansions are left. At a certain point in this procedure, before the fibres are completely severed, the tendon is seen to spring back and leave a gap between the divided ends. By rotating the eye outwards the amount of this gap can be watched and the advancement proceeded with. I cannot believe that this procedure weakens the muscle excessively or does any harm; on the other hand, it allows the advancement to be made much more easily with a more certain hope that the result will be a success.

My own plan, which, I admit, is subject to criticism, but which gives me a basis to work on, is as follows: For squints of fifteen degrees and under, simple advancement; for squints of fifteen to thirty degrees, advancement combined with tenotomy as described; for squints of over thirty degrees, retirement, followed by advancement a few months later.

I have found Worth's the most successful type of advancement. It is described fully in his book, and if minutely adhered to, gives, I think, the results he claims for it. However, as I stated before, I cannot obtain more than fifteen degrees easily, and here I find a difference from his statement that the result obtained at the end of the operation is the permanent one. I have invariably found, after taking off the bandages, several degrees less than I obtained at the operation, and in view of this I always overcorrect when doing a simple advancement. I should like to hear other members' experiences on this point. I depart from Worth's method when doing a combined operation, as I find it unnecessary to tie the sutures in the muscle itself. There seems to be no tendency for them to pull out when the internal rectus is temporarily weakened.

I use a 2% mercurochrome solution as preparatory treatment, and also after the operation, and take out the stitches usually on the eighth day. I do not intend to go into details of the operation, except to say that it is quite impossible to get a satisfactory sclerotic stitch with the ordinary curved triangular needle, but that if such a needle is carefully rubbed down with a fine stone, it can be converted into the correct type, and is actually easier, I think, to pass than the straight one made for the purpose. Also I consider it a good tip to pass the needle and silk through sterile vaseline before attempting to use them.

With regard to other methods, such as shortening the external rectus or tucking its tendon, I have seen several used, but I think they lack one most important point, in that they do not increase the muscle's mechanical advantage. I should like to mention here one very curious result of tendon shortening that I saw the other day in a patient who had had this operation performed on both eyes. The alignment was good when the patient looked to the front, but all power of lateral rotation had gone, making it appear that the shortened muscle was incapable of further effort.

Dealing as I do mostly with young patients, I do most of my operating under general anæsthesia. I do not think, provided an accurate measurement is made beforehand and some experience gained of the amount of correction to be obtained, that there is any disadvantage in this. In fact, I think it

makes the operation easier. Some nervous patients turn an operation under a local anæsthetic into a regular battle and increase the difficulty greatly.

I have not mentioned divergent squints, as on general principles the same remarks apply. The internal rectus is not so easy to advance as the external, also its advancement has less effect. Tenotomy alone of the external rectus is a useless procedure. The possibility of overcorrection when operating for external strabismus is negligible.

I have not included operative treatment of the heterophorias. They require a discussion of their own.

ARTHRITIS DEFORMANS.

By HORACE PERN, M.R.C.S., L.R.C.P. (London),
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I AM writing this paper as a plea for cripples, to the teachers of our profession, who are responsible for the moulding of its thought, hoping to satisfy their critical faculty.

I wish to show that the present day treatment of *arthritis deformans* is wrong, because it is not based on the laws of physiology and pathology; that for this reason the prognosis is wrong; and that the disease is curable even in advanced cases as long as they have not reached a stage of permanent destruction. All the patients are seen in the acute and subacute stages, when they are curable. I think it was King Edward who, as Prince of Wales, speaking on the crusade against tuberculosis, said: "If preventible, why not prevented?"

I am working in the country without X rays, without assistance of any kind except that of two devoted nursing sisters, simply using clinical observation. If I can get results, surely men who are thoroughly capable, working under ideal conditions, should get better ones.

I have written two papers on joints: "Common Joint Conditions"[1] and "Rheumatoid Arthritis".[2] This paper is a continuation, and I wish to say all my work is based on Sir Robert Jones's teachings.

Ætiology.

Arthritis, fibrositis and neuritis, which, I think, are undoubtedly manifestations of one disease, are very prevalent. There seems to be a great field for research work to find out the actual cause. The accepted theory is that the disease has an infective origin, an infective focus somewhere in the body. If that were the sole or main cause, then there should be a marked improvement as a result of treatment, as septic foci have been sought with great diligence. Common sense dictates their removal if possible, but, as I will endeavour to prove, some cause, be it infective or otherwise, sets up inflammation in the joint or tissues around the joint; then other factors, which have nothing to do with the original cause, come into play.

Physiology.

The physiology of a joint is the function or use which it has to perform, and this is the fundamental point, that function is mechanical, obeying mechanical laws.

Each joint is composed of anatomical structures which form the joint proper. Each structure is specially fashioned to perform its own individual function, each structure varying in each individual joint according to the special work it has to do. Each joint has its supports: ligaments, fascia, muscles, tendons; these supports also vary in each joint according to its use, its blood supply, drainage and nerve supply—all thought out by the great Master Craftsman—so that any interference with the joint must produce a characteristic result.

For the performance of its normal work in health it is essential that each individual structure, whether belonging directly to the joint proper or connected indirectly with its support or use, must be put to its proper function and must maintain its proper tone. Failing that, the whole must suffer in proportion to the failure; as all joints act mechanically, the resulting defect must be a mechanical one.

The joint may fail to function through some fault not connected with the joint structures; the joint may be put deliberately in a certain position so that it cannot act, or the nervous system may be at fault, entirely preventing movement or allowing only faulty movement. If there is no movement, no special changes will take place, and arthritis will not be set up. The tissues will obey the law of all tissues, and degenerative changes will take place, and if the position is maintained for long the tissues will adapt themselves to the new position. If the joint is used in its new position, it must obey mechanical laws and suffer for mechanical defects. These defects set up inflammation, and the extent of such inflammation will depend on its duration and its quality.

The essential factor is that the anatomy of a joint is founded on the physiology, and so if the physiology of a joint is altered, the anatomy will alter to adapt itself to its altered physiology, as illustrated in vocational habit. Nature's great objective is function.

Pathology and Symptoms.

The points I wish to bring out under pathology are the following:

(*a*) *Arthritis deformans* is not of itself a disease.

(*b*) The pathological changes that occur and are classified under the term *arthritis deformans* are caused originally by some irritant, probably bacillary, which sets up inflammation in the joint proper or structure surrounding the joint.

(*c*) Other factors then come into play, which are quite distinct from the original.

(*d*) All factors obey definite laws, the workings of which can be observed, forestalled, prevented.

McRae writes:

> There are three main forms of change: (i) Lesions principally in the synovial membranes and periarticular tissues (rheumatoid arthritis), (ii) with atrophic changes in the cartilage and bones predominating, and (iii) with hypertrophy and overgrowth of bone (osteoarthritis) . . . In many cases all forms of change are found, which speaks against the view that there are two distinct diseases.

McRae then goes on to describe the changes which take place in tissues, membranes and joints. Space forbids further quotation.

If we are to treat the described conditions, we must know the reasons for their production and the exact way in which they are produced. Unfortunately, in the present state of our knowledge, we do not know the cause, whether it is bacterial, chemical or metabolic; but we can work out the way the results are produced.

We know definitely that some cause sets up inflammation in the tissues in and around the joints. In inflammation, roughly, there is at first destruction, then a clearing up of damaged cells, and finally a process of repair.[5] As long as the injurious agent persists the process will be continued, a smouldering fire kept up, tending to destruction or chronic hypertrophy. Joints, like all other tissues, obey these laws, but, as joints are mechanical, they also obey mechanical laws.

The first symptom complained of is pain, which causes fear. Pathological changes are present and secondary changes are brought about because the joint is placed in a position which will relieve the pain and because movements are prevented through pain. Pain greatly increases the difficulty in this stage, both in reestablishing movement and correcting faulty positions. I have watched its effects clinically for years with much interest, and am certain no repair can take place while it is present.

It is very difficult to define what is fear and what is pain. Professor F. S. Langmead[4] says:

> It is now generally agreed thyreoid reacts to toxic factors as well as to sympathetic stimulation, by increasing activity. Fear is the preparation for flight and fight, and we believe it to be intimately connected with the activity of the adrenalin gland. The hormone of the medulla, by stimulating the sympathetic, quickens the heart, tones up the blood vessels, mobilizes sugar and must also provide increased thyreoid secretion. The outpouring of the adrenalin stimulates the sympathetic, which in turn stimulates the thyreoid and the suprarenal itself, whilst the increased thyreoid secretion for its part stimulates the adrenal still more, a process which, if unchecked, would lead to exhaustion of both glands.

We have here a vicious circle set up which can be stopped only by replacing pain and fear by relief and confidence, the pneumogastric through the central nervous system controlling the sympathetic. I conclude this is why some men are successful in treatment, while others are not, those who succeed having the power to inspire confidence, and the gift of giving. It is also important to remember that if the brain thinks that the correct movement increases pain, it will order the muscles to perform the movement in such a way as to cause less pain, and it may continue in the same way, so throwing strain on perfectly sound tissues.

There are three stages: (i) acute inflammation, (ii) chronic inflammation and mechanical defects, (iii) permanent changes with permanent mechanical defects. I shall take the first stage and as nearly as possible give cause, mode and reasons of production and results produced. The second and third stages merge one into the other, and will be taken together.

Acute inflammation is set up in the joint proper, and according to its severity, affecting synovial membrane, articular cartilage and, if present, fibrocartilage, produces an outpouring of synovial fluid. If the fluid is in excess, it will force the joint into the position in which there is greatest room for it; assisted by pain, the joint will assume the normal position of rest. If no excess of fluid is thrown out, the joint will still assume the same position to relieve pain. If inflammation is set up in the periarticular tissues, it will, according to its severity, affect the outside of the capsule, fascia, ligaments, tendons, sheaths and probably muscles.

Complete resolution may take place, either through Nature's own provision for rest or by the aid of treatment, the joint obtaining its full function; or the process may go too far, leaving behind an excess of fibrous or scar tissue matting up surrounding tissues, interfering with their blood supply and drainage, and altering position and mobility. This is most important to remember in treatment. I will deal with it under the heading "Treatment".

If resolution does not take place, a stage of chronic inflammation is reached, producing stage (ii) (chronic inflammation and inflammatory defects). This stage is caused either by the continuance of the original cause of the inflammation, unchecked by any treatment, or by faulty treatment, or by repeated trauma, produced either by the mechanically correct or incorrect use of the joint, which may destroy cells at one part and by irritation produce an irregular growth or heaping up of cells in another part, due to alteration in pressure.

Other forces will now come into play. If the joint has been allowed to remain in the normal position of rest, the natural supports lose their tone and power, the stretched tissues lengthen, the shortened ones contract. Gravity now acts; the best examples are as seen in the wrist. The normal position of rest of the hand is full extension; gravity produces the ulnar position. With the ankle, the foot at rest falls into plantar flexion; gravity produces abduction. The inflammation has now extended to the periarticular tissues, which may be considered as one with the joint. If they alone are affected, spasm has now been replaced by loss of power, and the same conditions are present. In other words, a stage is reached when the foundations have given way and the whole physiology is altered; this is the vital point. If the joint is now used in any way, it must be used incorrectly and must continue to be so used until the foundations

are renovated and made to assume their proper positions. This may take place in the early stages by the structures regaining their normal tone, but not in the latter stages; they then must be assisted until they get back their tone.

The process may (i) principally affect synovial membrane and periarticular tissues (rheumatoid arthritis), (i) cause atrophic changes in cartilage and bones, or (iii) cause hypertrophy of bone (osteoarthritis).

In the first event the synovial membrane has become chronically inflamed; if excess of fluid is thrown out, owing to alteration in drainage, it may remain for months causing over-stretching of the capsule, weakening of supports and instability of the joint, which in turn set up increased mechanical defects and further inflammation; finally, subluxation may take place. Whether fluid is thrown out or not, destruction, owing to the position of the joint and alteration of pressure, will take place in the cells pressed on, and an irregular growth or heaping up of the cells irritated (villous arthritis) will occur; this in turn will go on causing more irritation and further inflammation. In time partial recovery may take place, leading to adhesions; or complete destruction may occur and the joint become fixed in fibrous ankylosis (rheumatoid arthritis).

The cartilage cells, which normally have to withstand pressure, are specially made to withstand it. If the mechanism of the joint is now altered, the pressure will fall on cells not adapted to it. The cells which are continually under pressure and are being repeatedly destroyed by trauma, will die; ulceration will take place both in the articular cartilages and the fibro-cartilages, and the inflammation will extend to the underlying bone and in time will lead to atrophy of both structures. The cells which are only irritated will take on an irregular growth (nodular growth in the cartilage); the inflammation will extend to bone cells, producing bony outgrowths, which in turn will lead to further disorganization of the joint and bony ankylosis (osteoarthritis).

Other structures indirectly connected with the joint will suffer; as an example, the centre of gravity of the foot when in the extended valgus position will fall inside the triangle of the foot, causing toppling of the arch and flat foot, altering the whole line of forces of the leg to the inner side of the knee and inner side of the hip, and then altering the curves in the spine; all will suffer; all will be used mechanically incorrectly, the whole system of weight-bearing and propulsion will be altered. The hand, when in the extended ulnar position, causes inability to move the wrist and allows the fingers only to partially flex; the hand has lost its power and cannot be turned inwards for feeding; the physiology and mechanism of the whole are profoundly altered. And so the effects are thrown back to the whole systemic system and brain. We have now the whole picture of *arthritis deformans*.

Prognosis.

McRae writes:

> The age, general circumstances, character of the patient, the extent of arthritis and the variety are all important. The outlook is not as dark as is usually described. If the source of infection can be found early and properly treated the prognosis is encouraging. In many patients the disease runs a certain course, and, if they can be brought through with a minimum of damage, the ultimate outlook is good. . . . In the case of children the outlook is not good, but some recover entirely. . . . The outlook is good in local cases, but depends somewhat on the occupation and possibility of trauma.

Hutchison says:

> The paramount importance of early diagnosis and immediate treatment cannot be too strongly emphasized. If adequately treated in the early stages, within the first six months, the prospect of complete recovery is good, some observers claiming 80% of cures. When the disease is fully developed, complete recovery is rarely achieved, though the disease may be arrested. Long standing cases are a misery to themselves and the despair of the physician.

My personal opinion, based on thirteen years', more or less continued work on joints, is that the prognosis in acute inflammation is definitely good. In chronic inflammation and mechanical defects the prognosis is good, if the disease is treated correctly. Where permanent changes and permanent mechanical defects are present, the prognosis is hopeless. I do not want to be misunderstood in using the term permanent; I mean by it that the destruction of the joint has gone so far that there is no hope of recovery.

Treatment.

I take it the value of a paper is to give personal views and experience, so I will not quote from either Osler or Hutchison. I wish to say that I differ from both, for reasons I have already given. Treatment is based on (*a*) the physiology of joints; (*b*) the pathology of joints, its cause, mode, reason and results produced; (*c*) putting this knowledge into practical use.

Some cause, probably an infective one, sets up constitutional changes in the body and local inflammatory changes in the tissues in and around a joint or joints. Because the physiology of a joint is mechanical, mechanical forces come into play, which are quite distinct from inflammation. Unless treatment is based on those principles, it must be unsatisfactory. I have seen a fair number of joints affected by *arthritis deformans* treated by other doctors, and I have never obtained a history of the treatment of one on these lines.

The necessary treatment depends on the correct use of rest and mobility; that is extremely difficult and can be learned only by experience. The difficulty is that the same force that produces cure, if carried too far, or used incorrectly, does exactly the opposite—produces destruction. Rest relieves inflammation, so causes repair; if prolonged or carried too far, excess of repair takes place, producing stiffness and alteration of mechanism, which in turn sets up further inflammation and further mechanical defect. Movement applied at the right time, and correctly, maintains correct mechanism and assists repair; if applied incorrectly, it sets up

inflammation, which in turn causes alteration in mechanism, and so on.

In the acute stage the constitutional condition has to be treated. I take it that the infective bodies are in the blood stream and must be dealt with in the blood stream. They locally infect the tissues in and around joints and must be dealt with locally. The secret of defence is offence; the body and joints must be put immediately on the offensive; that is impossible unless the whole is at rest, mind and body. I have given Professor Langmead's opinion on pain and fear in another part of the paper. The sympathetic system is defensive and then destructive; the central nervous system is offensive and constructive. The need for action of the sympathetic must be removed by the abolition of pain and the substitution of comfort and optimism for fear and pessimism. Fortunately that is simple in the acute stages; in the other stages, owing to the mental attitude of the medical profession, the patients naturally adopt the same attitude; it makes the work very difficult, as there is the continual call on one's own nervous system, to be perpetually giving energy; it becomes very exhausting. Therefore, the objective in the acute stage is to procure rest, to prevent the process of repair from being carried too far, and to restore the normal physiology of the joint. The same applies in the subacute stage if the supports are intact, when rest is gradually substituted for activity. When the supports have given way, the joint has assumed the natural position of rest, the structures have adapted themselves to that position and pathological changes have taken place. Before the joint can resume its normal function and the pathological changes be cured it must be put back to its normal position and made to perform its normal physiology; the great law of Nature then comes into play, namely, the inherent power of repair in all living tissues. In the advanced stages, as long as there is some mobility, it is wonderful how the joints recover.

The three cardinal guides which assist diagnosis and treatment are pain, swelling, limitation of movement. With experience they can be used with mathematical precision. The duration of the disease need not be taken much into consideration; the virulence of the infection is the most important.

Observation and deduction from it give much information. Compare the same joint on the opposite limb and have complete relaxation. The contour will indicate if the synovial cavity is distended and the amount of distension, if all the periarticular structures or only a local part of them are affected or not. The position of the limb will indicate if the supports are intact or not. The difficulties of treatment can be gauged with quite a degree of accuracy by the trophic condition of the skin and muscles. If there is much wasting and the skin parchment-like and thin, the prognosis is usually bad.

The way the patient moves the joint, the acuteness of the pain and its locality, and the range of movement give most valuable information. If the limitation of movement is in all or most directions, almost certainly the joint is affected with arthritis; if in only one direction, then probably the periarticular tissues are locally affected.

When manipulative work is being done, the progress or not of recovery can be gauged by simple observation. Touch corroborates observation. The absence or presence of pain on pressure, and its intensity, are the surest guides in treatment; the progress to resolution can be estimated by subsidence of the pain. Touch is the sole guide in all manipulative work—the sense of resistance. The sense must be highly cultivated, so that the exact force required can be used, varying from the delicacy of touch in bending a child's stiff fingers to the utilization of all your strength in doing counter movements to a man's back. The hands of the potter are required to mould the joint back again into shape, reversing the order of things in exactly the same way as they occurred, slowly and laboriously stretching the tissues, increasing the blood supply with massage, if you have time to give it and know exactly how to apply it, by exercises strengthening the supports so that they can perform their normal function, and getting the joint used to its altered position by exercises and then counter movements, always building, never destroying structures or setting up inflammation by trauma.

When moving a joint or ordering exercises, the medical practitioner should see that full physiological use is obtained. By that I mean the full range of movement of the joint and the use of each group of muscles. All movements should be done slowly and deliberately, no jerking or rough movements being allowed.

In the acute stages put the joint at rest by wool pressure. Every time you take it down, which should be every two or three days, very gently put the joint through the range of movement allowed without producing pain; do not allow the patient to move the joint by himself. When you are satisfied the joint has recovered sufficiently, then, and not till then, make the patient, with your assistance and support, move the joint once through the range of movement allowed without producing pain. Gradually get full mobility and allow the patient full use of the limb when all tenderness on pressure has disappeared.

If these directions are followed exactly, I am convinced not only is there no danger in moving an acute rheumatic joint, but that it is necessary to prevent stiffness and excessive repair; also it assists nutrition. It is most important always to get complete relaxation of all muscles before attempting movement.

The treatment of inflammation in all stages is the same, the combination of rest and mobility; it is simply a matter of degree—the acuter the inflammation the more the rest, the less the inflammation the more the movement. The prevention of further inflammation, and assistance to resolution of the

present inflammation, are obtained by support and pressure. In the acuter stages I use wool pressure entirely, and in the later stages strapping. Wool pressure is ideal; it meets all the pathological requirements. If properly applied it relieves pain, rapidly gets rid of fresh exudation, steadily but surely clears up chronic exudation, and is very comfortable. The mode of application is as follows.

Take a one pound packet of wool and use the full width; wind around the joint at least three complete turns of the ordinary thickness of the wool; if thin then wind four turns of the wool. You must have bulk of wool. Bandage over the wool firmly; apply the bandage so that it pulls the joint into the physiological position of rest. Test the top and bottom of the wool for correct pressure and to see there is no constriction; on no account bandage over skin. Use calico bandages, four inch, for all joints except elbows and hands; use two and a half inch for these and two inch gauze for fingers. Tie the lower extremity on a pillow and the upper extremity place in a sling. Take down the dressing when needed, usually from two to four days; reapply, changing the wool when it has lost its elasticity. Strapping is very useful; its two uses are to give support and to exert local pressure.

As I have already said, with experience it is possible to use rest and mobility with mathematical precision. The extreme difficulty is for patients to grasp the way to use both. Under personal treatment the joint may become free of inflammation and have complete mobility; still the cells have not completely recovered, and even the treatment which you ordered may again set up inflammation, which, if treated for a few days, would subside and the process to complete resolution go on. If rest were not substituted for mobility, then the inflammation would progress and a vicious circle be set up, the joint returning to its original condition. This is the cause of much disappointment.

Reports of Cases.

I shall now quote cases. All except the first patient mentioned have been under the care of other medical practitioners; some have seen consultants; all have had prolonged treatment; all have been given the accepted treatment of the day in whole or in part. None has had local rest for the joints; all have done badly; the prognosis in all cases was bad, so I think it is fair criticism to say that the principles on which the treatment was based are wrong. If the same patients are then treated on other principles and they show improvement and get well, then the reasonable deduction is that these principles are correct.

CASE I.—A.H., a male, aged fourteen years, was seen for the first time on April 18, 1932. He had been ill for three days and had suffered a great deal of pain, and swelling in both knees and ankles. The temperature was 38·3° C. (101° F.). The condition was one of acute rheumatic arthritis of both knees and ankles, with average increase in the synovial fluid. The patient was put to bed and given sodium salicylate aperients to insure an action of the bowels every day, and a milk diet. Wool pressure was applied to all joints. He has been completely free of pain since, and has gone straight ahead.

The bandages were removed on April 21. I put all joints gently through the whole range of movement and reapplied wool and bandages. On April 24 the bandages were again removed; all swelling had completely subsided. I put all joints through the whole range of movement and reapplied wool and bandages. On April 28 the same steps were taken. I then allowed the bandages to become loose, and told the patient to move the joints as far as the bandages allowed.

On May 7 the joints were completely free of pain on his own movements; there was no tenderness on pressure. All dressings were removed; free use of the limbs was allowed in bed. He was to be allowed up and about in a few days.

The points I wish to stress in this case are the general efficiency and extreme simplicity of the treatment; the use of two pounds of wool and four calico bandages gave complete relief from pain and immediately allowed the whole body to assume the offensive.

CASE II.—A nurse, aged thirty-two years, complained of pain and stiffness in the fingers since January, 1928. Similar symptoms developed in the feet and the right knee. She received medical treatment and continued work, with slight improvement, up till June, 1929, when all her joints became worse. She then went through a course of "Fibrolysin" injections, which produced improvement for a time, and then she relapsed. Her tonsils were removed in February, 1929. In April, 1929, she gave up work. I saw her at the end of August, 1931. Both hands were in the typical ulnar position, the wrist joints were enlarged, there was limitation of movement in both; the right was worse than the left. Walking was bad, both feet were swollen, and there was tenderness over the *os calcis* and over the metatarso-tarsal joints; both feet were everted. Both knees had grating and pain on movement; in the right elbow joint synovitis and limitation of movement were present.

I finished personal treatment in October. Before she left the district she nursed two patients for me, one a big man with pneumonia. Both hands had recovered, the feet were practically normal, though there was a little tenderness at times; the knees had recovered. I could straighten the elbow; she could not do so without assistance. There was still a little fluid in the radio-ulnar joint.

A letter dated May 10, 1932, read:

> I am able to do everything except polishing and washing floors. My wrists and hands are good; sometimes the fingers swell, but they soon recover; elbow seems much about the same; both shoulders give me pain. Feet are tender, but no swelling. General health good.

CASE III: Mrs. H., aged twenty-four years, suffered from acute swelling in both ankles and knees in June, 1931. She was seen by a doctor who prescribed drugs and ordered her to bed. She was allowed up in ten days, though her knees were still partially swollen and tender. She got about with great difficulty. She relapsed in three weeks' time, and both wrists and fingers became affected as well. She was ordered to bed for ten days and the drugs were continued. She was then allowed up, her joints being in the same condition. Her elbows became affected in August. From that time until I first saw her she was unable to dress herself or perform any work, and could only hobble about with great difficulty and a lot of pain. Her knees became bent in September. She was seen by several doctors, including consultants. The last two doctors pronounced her to be incurable. She refused to have vaccines; compresses to joints and electrical treatment were given.

I first saw her on October 14, 1931. I admitted her into my hospital. At that time she was very nervous, and highly strung and emotional at times. Both elbow joints had definite limitation of movement. Both hands were in the typical ulnar position; both wrists had increase in the synovial fluid and general thickening and definite limitation of movement. Both knees were extremely tender to movement; they had increased in the synovial fluid and general thickening; both flexed at an angle of 45°. She was discharged on December 8, owing to financial circumstances. Since then I have treated her by correspondence and have seen her occasionally. I last saw her on May 2, 1932. Her elbow joints have full mobility; she has to use some force to obtain it. Her hands are quite normal. Walking is normal; she complains of a little pain

when commencing to walk. Knees are normal in contour, have full mobility and are quite straight. Her cartilage cells have not quite recovered, so I ordered her to continue her exercises, but to take only very limited walking. She will completely recover.

CASE IV.—A boy, aged eleven years, was taken ill in June, 1931. Pain and swelling in the right wrist occurred first; all other joints became affected gradually. He was admitted into a public hospital on July 21, and remained there until October 19. His treatment consisted of compresses to joints, medicines, vaccines, diathermy, tonsillectomy early in October. I do not know at what period he was allowed to walk. When I saw him first, he was an undersized boy with a tragic face; his neck was stiff and held in a position of flexion; both shoulders had definite limitation of movement; the elbow joints were affected; the hands were in the typical ulnar position, and their joints were enlarged; there was hardly any movement in the joints of the hands; there was no power in the fingers. He had difficulty in feeding himself; he balanced his spoon on the back of the thumb and little finger. Both hip joints were very stiff; the knees had some creaking and fair mobility; both feet were in the extreme extended and abducted position; the ankle joints were enlarged and very tender, but had fair mobility. All limbs and the body were very wasted. He had the mentality of a complete invalid. He was unable to do things for himself and cried at night and awakened people to make him comfortable, as he could not move himself. He was discharged on May 4, 1932. Unfortunately I did not measure him on his arrival, so can only say he grew a lot. Also I did not weigh him on his arrival. He had put on thirteen pounds in weight in about four months. His general condition is splendid; he is a happy, cheerful boy. He has full mobility of all joints, except the hip joints, which have not quite a full range of movement, but I think that will come with continuation of the exercises. He has a little limitation of the lateral movements in both wrists, and there is still a little thickening in both wrist joints, but it is clearing rapidly. He does everything for himself, puts on his socks and shoes, dresses and washes himself. His feet are in perfect position, and the arch is full.

These three cases were of the subacute type, with mechanical defects; the supports of the joints had given way. The patients were all treated in the same way, by means of rest, pressure, mobility, to assist in clearing up the chronic inflammation; gradually, slowly and laboriously the contracted tissues were stretched, each step being consolidated by exercises, moulding the structures back again to their normal positions, and then with exercises and counter movements the supports were strengthened so that they will be able to perform unaided their normal functions, the whole process daily requiring a great expenditure of time and energy. The time each case took to obtain the objective I should consider to be about the average time for personal intensive treatment.

I will give brief notes of four patients under my care at present; they are all suffering from chronic rheumatoid arthritis.

CASE V.—Miss S., aged about fifty years, has suffered from swelling of wrists and fingers, creaking knees, tender feet, since 1928. I commenced treatment on March 1, 1932.

CASE VI.—J.H., a man, aged sixty-nine years, has had arthritis of the hands and knees since 1922. I commenced treatment on November 14, 1931.

CASE VII.—Miss D., aged sixty-two years, has suffered from arthritis of the hands, knees and elbows since 1925. I commenced treatment on January 1, 1932.

CASE VIII.—Mrs. D. has had arthritis of the hands for two years; her knees were similarly affected several years before. I commenced treatment on March 3, 1932.

The hands in all cases were in the usual ulnar position. There was chronic thickening, usually with increase of synovial fluid, in some or all of the following situations: wrist joints, metacarpo-phalangeal joints and phalangeal joints. They also suffered from what is a frequent condition in old-standing affections of the hands—enlargement and definite relaxation of the radio-ulnar joint and increase in the synovial fluid.

To the time of writing, May 9, 1932, all the patients have done well. All have practically full use of the hands; inflammation in all has nearly subsided; the radio-ulnar joints have regained their tone; all the patients have regained the normal position of their hands. All are still under treatment. The prognosis in all cases is good. I find hands generally satisfactory to treat. Knees come under a different category. The knee joint is the most difficult joint in the body to treat. All the knee joints are doing well. Mr. H. (Case VI) has full mobility in both knees, but one knee he cannot straighten without assistance. The other patients all have full mobility. In all cases the inflammatory conditions are clearing up well and the contour is returning to normal. Perhaps the most distressing symptom, apart from pain, is a feeling of instability of the joint that is recovering with exercises. I have great hopes for all.

Though the description of these cases is brief, it gives some indication of what can be done for chronic joint conditions. The length of time that the condition has existed need not be taken into consideration in mapping out a line of treatment.

I sincerely trust that I have been able to express my thoughts lucidly, and my earnest prayer is that, by doing so, somebody may be saved from needless crippling. I am afraid those who do joint work must go through their hours of darkness; in those hours the guiding star must be the inherent power of repair in all living tissue.

Acknowledgement.

I should like to offer my sincere thanks to Mr. Fay Maclure for his valuable help.

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"SODIUM AMYTAL" AS A SEDATIVE IN OPHTHALMIC SURGERY.

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To the ordinary operative risks of intraocular surgical operations under local anæsthesia there is added another, depending on the conduct of the patient himself. He may lose self-control, may cease to cooperate with the surgeon, and may even become panic-stricken. Should anything of this nature occur, the operator may thereby be involved in the

greatest difficulty, and the success of the operation may be gravely imperilled.

In all other surgical procedures in which a local anæsthetic must be used, one can have recourse to one of the usual narcotics, such as morphine, to quieten the patient during the actual operation. In these operations it is of relatively little importance whether the patient vomits or becomes slightly restless as an after-effect of morphine, compared with the disastrous results which can be, and often are, caused by restlessness and vomiting after an intraocular operation.

When used for patients who appeared to be otherwise uncontrollable, I have seen morphine, hyoscine *et cetera*, produce post-operative vomiting so consistently (and frequently with such tragic results) that I have become afraid to use them. Bromides in my hands have been quite useless. They depress the patient and may make the operation appear a more terrifying ordeal than ever, while self-control is not in any way helped.

As a result it was decided to try "Sodium Amytal", not as an anæsthetic, but as a sedative to be used in conjunction with the usual local anæsthetic.

An ideal sedative for use in ophthalmic surgery would be one which satisfies the following three conditions: (i) The drug must leave the patient sufficiently in control of his faculties to cooperate with the surgeon and to obey instructions. (ii) Pre-operative nervousness and the tendency to lose self-control during operation should be removed or diminished. (iii) Under no circumstances must the drug cause post-operative vomiting, delirium or restlessness.

In adequate doses "Sodium Amytal" produced almost an ideal result, and though I admit my list of fifteen patients who had graduated doses is far from large, the results seem sufficiently satisfactory to justify publication.

Dosage.

In all cases "Sodium Amytal" was given by mouth and, in addition, a local anæsthetic consisting of a 4% solution of cocaine hydrochloride containing 2·0 mils to 100 cubic centimetres (ten minims of adrenaline to the ounce) was used.

The first two doses given were rather much; the patients became too sleepy to obey instructions, so they were returned to the ward and the operation postponed to the following day. They had a dose of about 9·0 milligrammes per kilogram (one grain per stone).

The next dose tried was 2·2 milligrammes per kilogram (one quarter grain per stone). This dose had no apparent effect, but by increasing the dose to 4·5 milligrammes per kilogram (half a grain per stone) the results were much better; especially amongst the older patients (over fifty-five) the results were ideal. Amongst people rather younger (under fifty-five) a slightly larger dose proved better, for example, 5·4 milligrammes per kilogram (three-fifths of a grain per stone). I made the mistake of giving one fat woman of fifty odd years 5·4 milligrammes per kilogram, without allowing for excess fat weight, and as a result she became non-cooperative, and the operation had to be postponed. This was a very obvious mistake, because it is apparent that if it were necessary to give a woman aged thirty, weighing 63 kilograms (ten stone), 0·36 gramme (six grains) (estimated at 5·4 milligrammes per kilogram), it should not be necessary, when the same results were required, to give her 0·54 gramme (nine grains) for no better reasons than that she weighed 94·5 kilograms (fifteen stone) and was fifty years of age.

"Sodium Amytal" is a barbituric acid derivative, the sodium salt of iso amyl-ethyl barbituric acid, and it is a well known fact that a percentage of people show an intolerance to barbituric acid and its derivatives, but I have never seen any signs of intolerance to "Sodium Amytal" develop in patients whose total dose was 6·7 milligrammes per kilogram (three-quarters of a grain per stone) or less, although I have seen it with the larger doses.

Particularly I remember witnessing a cataract extraction on a lady who had "an anæsthetic dose" intravenously. As a spectator I had difficulty in deciding whether the patient was alive or dead; the anæsthetist, however, seemed confident that she still lived. The surgeon had a very bad twenty minutes though, because the eyes had rolled up and they stayed up. An eye could be pulled down, but as soon as the grip of the fixation forceps was released the eye flew up again, as though on a spring. However, in due course the cataract was removed and the patient returned to bed, where she remained unconscious for about twelve hours. At the end of this period she sprang from bed and could be prevented from going straight home only by force, an obviously undesirable form of post-operative treatment for cataract extraction. It turned out that she had rather more than 13·5 milligrammes per kilogram (a grain and a half per stone). She was fat, and the dose had apparently been calculated on her total weight. In addition, she was well over sixty.

However, in case any signs of intolerance should develop, it seemed advisable to take some precautions to secure a timely warning, and the rule adopted was to divide the dose, two-thirds being given one hour and a half to two hours before operation, and one-third half an hour to three-quarters of an hour before operation. The idea was to postpone operating for twenty-four hours if any abnormal restlessness *et cetera* developed. This procedure gave a better chance of the patient's susceptibility to the drug being gauged, so that the final dose could be altered or omitted according to circumstances. Further, any miscalculation in the way of underdosing or overdosing could thus be dealt with.

Other factors that allowance must be made for are age and excessive fat.

The hypnotic effect of "Sodium Amytal" on people who show definite senile changes seems to be more pronounced, and the best results were obtained from a dose based on 4·5 milligrammes per kilogram (half a grain per stone) in people from about fifty-five onwards.

The question of fat weight is not so easily or accurately disposed of. Assuming the best basis to work on would be the weight in kilograms of the

adult between twenty-five and thirty years of age, it does not require a very great stretch of imagination to deduct several kilograms (five, ten or even twenty) from the weight of fat middle-aged people, according to one's estimate of their probable weight between the ages of twenty-five and thirty.

Those people who received a total dose of more than 0·42 to 0·48 gramme (seven to eight grains) almost invariably did not cooperate very well, so it does not seem advisable ever to exceed this total dosage, and for people over about fifty-five, 0·3 to 0·36 gramme (five to six grains) should be the maximum.

If a satisfactory hypnotic effect cannot be produced by these amounts, further dosage is liable to produce sufficient stupor to render the patient non-cooperative, and in addition there is an increased tendency to develop post-operative restlessness.

Contraindications.

The only reasonable contraindication to a small, accurately graduated dose seems to be a known idiosyncrasy to barbituric acid or any of its derivatives.

Advantages Obtained from "Sodium Amytal" in Sedative Doses.

I have kept a detailed record of seven trephine cases and eight cataract extractions in which the patients received a dose of "Sodium Amytal" based on the foregoing system. In addition to these fifteen cases there were five or six others, of which I kept no detailed records, because the doses given varied from 9·0 milligrammes per kilogram (one grain per stone) to 2·2 milligrammes per kilogram (one-quarter of a grain per stone), and the effects varied from rendering the patient non-cooperative to such an extent that operation had to be postponed till next day, to no apparent effect at all (in the 2·2 milligrammes per kilogram dose).

The ages of these patients varied from forty to seventy-eight, and their weights from 31·5 to 75·6 kilograms (five stone to twelve stone).

Possibly the most striking effect of the drug was on the mental attitude of the patient. Worry about the operation and nervousness were greatly diminished, and in some cases disappeared, even in the excitable type of patient.

None of the patients at any stage showed signs of losing self-control or of pain. Each patient was able to carry out instructions during operation, and there was no trouble with uncontrolled blinking or squeezing of lids.

Under ordinary circumstances patients usually complain of pain during the iridectomy, but amongst the fifteen patients who had "Sodium Amytal", one only (a patient subjected to a trephine) complained of pain. I think it may fairly be claimed that the iridectomy is the critical stage of a cataract extraction, and anything that will bolster up a person's self-control without penalties in the shape of post-operative vomiting *et cetera* more than justifies itself.

The post-operative complications due to "Sodium Amytal" were conspicuous by their absence.

Some of the patients slept for several hours after being returned to bed. One or two patients who complained of discomfort and inability to sleep in the evening after operation were given a further 0·12 or 0·18 gramme (two or three grains) of "Sodium Amytal".

From my point of view, the most interesting case was that of a patient with a cataract on whom I had done a right extraction some nine months previously without the aid of "Sodium Amytal". At that time the patient lost her self-control after the iridectomy, and I had the greatest difficulty in finishing the operation. Chiefly by good fortune, a reasonable result had ultimately been obtained, but the idea of a further adventure of this nature did not appeal to me.

Using "Sodium Amytal" I had not the slightest trouble, and the patient did not even complain when the iridectomy was done. Afterwards she informed me that she had not minded the operation at all, and had not been nervous after the administration of the first dose of "Sodium Amytal", nor had she noticed any pain like she felt on the previous occasion. The local anæsthetic was exactly the same on both occasions.

Summary.

"Sodium Amytal" appears to be a very suitable pre-operative sedative in ophthalmic surgery, provided it is given in suitable doses.

"Sodium Amytal" should always be given by mouth, and the most suitable quantities are: (*a*) In adults up to about fifty five years of age, 5·4 milligrammes per kilogram (three-fifths of a grain per stone); (*b*) from fifty-five onwards, 4·5 milligrammes per kilogram (half a grain) per stone. The dose should be administered in two parts, two-thirds of it being given one and a half hours to two hours before operation, the remainder half an hour before operation.

When the patient is required to cooperate (in the ophthalmic sense), the total dose should never exceed 0·42 to 0·48 gramme (seven to eight grains) in the first class (up to fifty-five years of age), and 0·30 to 0·36 gramme (five to six grains) in the second class (over fifty-five). Further allowance should be made for excessive fat and manifest senility.

The contraindications are known intolerance to barbituric acid or any of its derivatives.

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Reports of Cases.

ECLAMPSIA WITH AMAUROSIS DUE TO DETACHMENT OF THE RETINÆ.[1]

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Obstetric History (W. L. Crowther).

THE ordinary albuminuria of pregnancy, in spite of ante-natal care, is still far from uncommon in hospital and private practice. Such patients frequently show some degree of impairment of vision, which disappears as the primary condition responds to treatment. When, however, actual amaurosis is encountered, the question of the ultimate prognosis to the patient's vision becomes of the first importance. Such a condition is in my experience very rare in practice, and the case now to be described has been one of great clinical interest.

Mrs. B.L.W., aged twenty-three years, a *primipara*, was admitted to the Queen Alexandra Hospital on February 23, 1932. Her condition was then one of threatened eclampsia. Œdema, which was generalized and of excessive degree, had been gradually coming on for a fortnight.

Her home being fifteen miles from Hobart and there being no resident medical practitioner, she had had no ante-natal supervision. On admission the temperature was 36·1° C. (97° F.), with a pulse rate of 92. Œdema of face, neck, legs and ankles was very marked. The urine was solid on the ordinary boiling test for albumin. The systolic blood pressure reading was 200. This was her first pregnancy and she expected to be confined at the end of April. There was no history of any preexisting kidney disease, in fact, she stated that she had never had to have medical advice during her life. She was given calomel 0·3 gramme (five grains). A mixture of sulphate of magnesia was given every two hours and her dietary was restricted to water and barley water.

On February 24, 1932, little change was observed in her condition. The systolic blood pressure was 184 millimetres of mercury and slightly less albumin was present in the urine. It was not possible to measure the total amount of urine owing to the frequent motions. She vomited several times, the œdema seemed more marked and for the first time she complained of dimness of vision. A compound capsule of thyreoid, parathyreoid and calcium was prescribed to be taken three times a day.

On February 25, 1932, the systolic blood pressure was 176 millimetres of mercury, albumin was "three-quarter solid" in the test tube. Three and three-quarter pints of fluids were taken. The bowels were still acting freely. A little milk was added to the dietary.

On February 26, 1932, a distinct improvement was noted in the amount of albumin; the urine was now only "one-third solid". Fluids were taken freely, and there were seven motions in the twenty-four hours; the mixture of sulphate of magnesia was discontinued. The dimness of vision was, however, more marked, amounting to a blurring of her sight.

On February 27, 1932, the albumin was unchanged and the systolic blood pressure was 150 millimetres of mercury. There was some lessening of the œdema, and a general slight improvement of her condition was noted. The thyreoid compound capsules were omitted, and the dietary was increased by milk foods.

On February 29, 1932, when I first saw her, the condition was not so satisfactory, the systolic blood pressure was 190 millimetres of mercury and the albumin had increased, the urine passed in the twenty-four hours amounting to thirty-four ounces.

A red macular rash was to be seen on the neck and chest, also there were epistaxis and considerable impairment of vision. Glucose, 10% in saline solution, was ordered to be given every four hours *per rectum*, and in view of the grave threat of the onset of eclampsia it was decided to induce labour.

On March 1, 1932, the condition being not so satisfactory, induction was done surgically without anæsthesia. The systolic blood pressure was 200 millimetres of mercury, and albumin was nearly "solid". The rectal tube, with gauze packing, was left in for twenty-four hours and on removal a douche given.

Through the afternoon of March 2 three injections, each of five minims of pituitrin, were given with an interval of two hours between them. Slight epistaxis followed with the onset of pains. These became stronger through the evening and she was delivered of a living female child at 12.10 a.m. on March 3, 1932. The placenta followed ten minutes later and was normal in appearance, except for a few small fibrosed patches.

The child was a healthy premature female, weighing 1·4 kilograms (three pounds two ounces). At 1 a.m. the patient seemed to lose her power of coherent speech and was unable when talking to form her words correctly. Without further warning, at 4.30 a.m. she had an eclamptic seizure, lasting five minutes and typical in onset and signs. There was, however, no marked cyanosis nor did she become unconscious.

With an injection of morphine 0·015 gramme (a quarter of a grain), calomel 0·3 gramme (five grains) by the mouth, a bowel wash-out and packs to the lumbar area as treatment, she had no more attacks, although she was wandering in her mind and twitching through the day. Glucose and saline solution injections were also continued. During this afternoon she told me she was blind and quite unable to see.

On March 4, 1932, there was a distinct general improvement, with an Esbach reading of 2. On microscopical examination I could find no casts or red blood cells. The amaurosis showed no change and she was unable to distinguish light from darkness.

Dr. W. W. Giblin, consultant to the hospital, was asked to see her, and during the afternoon she was examined by Dr. J. Bruce Hamilton, whose report follows. The lochia was scanty and she had marked amnesia, but could follow questions and answer them intelligently.

On March 5, 1932, she was able to distinguish light from dark, and the dietary was increased.

By March 10, 1932, the general improvement since delivery had been excellent, for five days the temperature being between 38·3° and 37·2° C. (101° and 99° F.). The lochia had been both scanty and a little heavy during this period. Each day she stated that there was increasing perception of light and ability to distinguish various articles. On March 10 she could distinguish the hands of a watch. The baby, treated on premature lines, had also made steady progress.

At the end of three weeks the mother was sufficiently well to leave hospital, coming back each day in order to give what breast milk she had to her child.

The latter today (April 6, 1932) is thriving and just under 2·2 kilograms (five pounds) in weight.

Comment.

The difficulty in such a case as this is to know when the ordinary slight degree of visual impairment, which in practice we are accustomed to see clear up without leaving permanent damage, passes into a more serious condition. It is rare to see amaurosis, and the increasing severity of the visual signs was an important factor in deciding on induction.

A. Mayer[(1)] states that sudden blindness during pregnancy is almost invariably followed by an eclamptic convulsion and that sudden blindness may be the first sign of a latent eclampsia. If amaurosis occurs before term, expectant measures may be justified for a time and in the fœtal interest; nevertheless, the child will be still-born in many cases. Another point of great importance that

[1] Read at a meeting of the Tasmanian Branch of the British Medical Association on April 12, 1932.

he makes is that amaurosis was regarded as functional formerly, but recently cases have been recorded with organic lesions of the fundus, such as retinitis, papilloretinitis, hæmorrhages and retinal detachment.

With such a degree of toxæmia it was a great surprise to find not only that the baby was alive at birth, but that it was of good colour and made satisfactory progress, until it is now a normal healthy child.

There was nothing to be found in the history of either parent to explain the onset of the œdema and albuminuria. The patient is now free from albumin and has no signs of chronic nephritis.

In regard to subsequent pregnancy, with its danger of permanent complete loss of vision, I feel that any future pregnancy should be terminated. On this point Dr. Hamilton comments more fully.

Notes on Eye Condition (J. B. Hamilton).

On March 4, 1932, I was asked by Dr. W. L. Crowther to examine Mrs. W. for loss of vision which had been noticed for ten days and which had increased considerably during the preceding three days. On examination I found:

Right Eye: White. The pupil reacted fairly briskly to light and was active to accommodation. The tension of the eye was normal to full. Homatropine and cocaine were instilled and under mydriasis the condition of the fundus was as follows: Extensive detachment of the retina was present, both temporally and below; this detachment was tense and steel grey in colour and was ballooned forwards to within a few millimetres of the posterior lenticular surface. The remainder of the retina was in a state of acute œdema and it appeared in certain areas as if it were partially detached too. No hæmorrhages were visible, nor did the optic disk appear to be grossly involved in the œdema. Right vision was confined to perception of hand movements at fifteen centimetres (six inches).

Left Eye: White. The pupil was sluggish to light, but active to accommodation. The tension of the eye was normal to full. Under mydriasis the condition of the left fundus was found to be very similar to that of the right, except that the temporal detachment was more extensive and partially obscured the optic disk. No retinal hæmorrhages were seen, and the condition of the optic disk was practically normal. Left vision was confined to perception of shadows only.

On March 11, 1932, I again examined the patient under mydriasis and I found that both right and left detachments had almost subsided, but that the retinæ were still intensely œdematous. There were scattered hæmorrhages surrounding both optic disks.

On March 23, 1932, both detachments had completely disappeared and the retinal œdema had likewise completely subsided. No retinal hæmorrhages were to be seen, but the right and left maculæ showed definite pigmentary changes. Right vision consisted of ability to count fingers at two metres. Left vision consisted of ability to count fingers at three metres.

On April 1, 1932, the patient had sufficiently recovered to be examined more thoroughly. The pigmentary degeneration at both maculæ was more marked, that in the right eye being worse than that in the left. Also pigmentary changes were commencing to encircle the optic disks at about three millimetres distance. No exudates or hæmorrhages were seen and both fields of vision were normal to $^{4}/_{330}$ white.

$$\text{Right Vision: } \frac{6}{36} \text{ and J4 with } \frac{+2{\cdot}0 \text{ D.S.}}{+1{\cdot}5 \text{ D.C. ax. } 20^\circ}$$

$$\text{Left Vision: } \frac{6}{24} \text{ and J3 with } \frac{+2{\cdot}0 \text{ D.S.}}{+1{\cdot}5 \text{ D.C. ax. } 165^\circ}$$

Comment.

Obviously the condition above described was an acute œdema of the retinæ similar to that which occurred in other portions of the body. The detachment which was caused by this œdema was of a very definite steel grey colour and very obviously resembled a lightly pigmented melanotic sarcoma. The colour, so strikingly different from the usual rose pink of an exudative detachment, indicated that the exudate which had produced the detachment had occurred in the choriocapillaris and not in the interretinal space, thus detaching both the internal and external retinal layers. The pigment of the external layer was responsible for the grey colour. I think this assumption is borne out by the marked pigmentary disturbance which has so rapidly followed. Almost concurrently I watched an acute retinal œdema caused by an embolism of the central artery of the retina, and after seven weeks there was no sign of any pigmentary disturbance, nor after eight weeks in a myopic detachment cured by ignipuncture was there any marked pigmentation. In neither of these cases was there any disturbance of the external retinal layer.

The reattachment of the retina as the general œdema subsided was only to be expected, but the occurrence of a detachment during eclampsia is, according to Heine,[1] an indication of the presence of chronic nephritis, and consequently in such cases the prognosis as regards life is poor. Subsequent history and urine analysis will prove or disprove this assumption.

The prognosis as regards vision is undoubtedly poor, and the point that arises is, should future pregnancies be permitted? Recurrence of detachment has been reported at subsequent pregnancies from more than one clinic and on some occasions has resulted in complete blindness. This patient certainly cannot afford to run the risk of further visual reduction, and I feel that further pregnancies are very inadvisable.

In conclusion I thank Dr. Crowther for allowing me to see this patient.

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[1] A. Mayer: *Zentralblatt für Gynäkologie*, December 5, 1931. Abstracted in "Epitome of Current Medical Literature", *The British Medical Journal*, February 20, 1932, page 35.
[2] J. Ringland Anderson: "Detachment of the Retina", First Edition, page 193.

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R. G. Waddy: "Sequelæ to the Toxæmias of Pregnancy", THE MEDICAL JOURNAL OF AUSTRALIA, December 21, 1929, page 883.
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HÆMATOMETRIA AND UTERINE MALDEVELOPMENT.

By I. GRAHAM, M.B.,
Boggabri,

AND

C. ANDERSON, M.C., M.B., Ch.M.,
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THIS case is reported not so much from the point of view of the hæmatometrium as from the most unusual development found at operation. In none of the text books at our disposal can we find such a condition described, and so thought that it must be a very rare finding indeed.

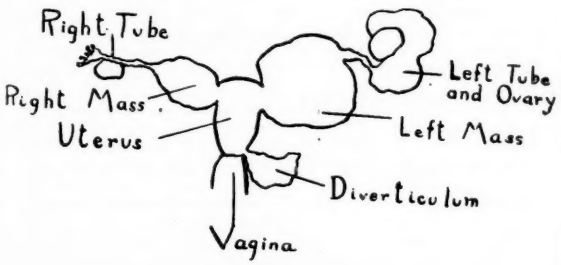
On February 12, 1932, G.W., a female, aged thirteen years, consulted one of us (I.G.). She complained of irregular spasmodic pains in the left iliac region and over the coccyx, when sitting down, for the three previous days. These pains had been noticed some months before, and lasted about two weeks, but had then disappeared. She had not menstruated.

She was thin and pale. Her temperature was 37·3° C. (99·4° F.), pulse rate 90 per minute. The heart and chest were clear. There was no abdominal rigidity, but there was a tumour palpable in the abdomen, rising to the level of the umbilicus, and lying mainly in the left iliac and lumbar regions. The right border of the tumour extended to a point about midway between the mid-line and the right iliac crest. It was rounded, irregular and tensile; but no bruit was discernible. On examination *per vaginam*,

under a general anæsthetic, the vagina was found patent. There was a tense elongated sac filling the vagina completely and extending to within 0·6 centimetre (a quarter of an inch) of the vaginal outlet. Gradual evacuation resulted in the discharge of a large amount of thick chocolate-coloured discharge. The abdominal tumour had decreased to about a quarter of its original size after two days. *Per vaginam* examination again at this date revealed that the cervix was undeveloped, the left tube was distended, there was a small, rounded, soft tumour in the mid-line, and the *fundus uteri* was not palpable.

Operation was performed under "Avertin" anæsthesia on February 24. A large rounded mass of uterine tissue attached to the left cornu of the uterus presented in the wound, and to it was attached a dilated and occluded Fallopian tube, filled with blood and bound down by adhesions to an enlarged cystic ovary. The right cornu of the uterus had a small mass projecting from it, and to it was attached the left Fallopian tube, apparently normal. The uterus itself appeared to be normal in size for the age of the patient. From the left anterior surface of the cervix another diverticulum extended between the inferior surface of the bladder and the superior surface of the vagina. A subtotal hysterectomy was performed, leaving the right ovary. The diverticulum was not interfered with, owing to the danger of being unable to differentiate it from the bladder and vagina. Examination of the vagina afterwards revealed that the cervix was not normally developed, being represented only by a dimple, but a probe could be passed through it, where formerly drainage had been instituted. The patient was discharged on the nineteenth day.

Examination of the specimen later showed that all the masses attached to the uterus were uterine tissue and filled with menstruum.



Discussion.

The uterus develops from a fusion of the Müllerian ducts. It would appear in this case that the fusion took place normally, but instead of the process ceasing there, the formation of uterine tissue continued a stage further and produced the masses attached to the cornua. The diverticulum between the bladder and vagina may possibly be the result of incomplete obliteration of the lower end of the Müllerian ducts and the urogenital sinus, when the vagina and bladder became differentiated.

Reviews.

THE BASIS OF SYMPTOMS.

ONE of the greatest difficulties with which the busy practitioner has to contend at the present day is the ever-present struggle of "keeping himself up to date".

To help him in this, admirable monographs are published, in such series as "Modern Views" or "Recent Advances", which go far to saving him from the labour of picking out the gold from the sand of the many hundreds of papers written each year. In most of these there is some discussion on the relation of signs and symptoms to the underlying processes, but there has been a lack of books dealing with this subject in a general way.

Such a lack Professor McDowall has attempted to fill.[1] A physiologist by calling, he is yet evidently a clinician of no small experience, and he keeps a constant view of the relation between consulting room and laboratory.

The plan of the book is to take each system of the body in turn, discuss first its physiology, deal with the pathological conditions which may alter its normal function, and then with the ways in which these changes manifest themselves to the clinician. Or he may take a particular sign, such as the pulse, and discuss the changes which may occur as evident to the examining finger; he then considers the causes and mechanism of these changes. No very elaborate detail is given, and many will complain that in their particular subject the information is rudimentary; but to the ordinary worker who has a day's hard work to do each day and not much time for deep reading at the end, the book will be a godsend.

An example of the author's breadth of view is that on functional nervous diseases. To the average physiologist and many neurologists the work of Freud and the analytical school is anathema—neither good physiology nor good psychology. Not so to Dr. McDowall, who carefully considers the evidence and concludes: "In such abnormal states (neuroses, psycho-neuroses and psychoses) these principles can be so frequently demonstrated and the results of their application so accurately foretold, it seems presumptuous to cavil sometimes at their apparent lack of physiological and anatomical foundations."

There is a curious omission from otherwise excellent chapters dealing with the heart and circulation, in that no mention whatever is made of coronary disease and its symptoms. Seeing how greatly the diagnosis of this condition depends upon symptoms and how constant and significant are the electrical changes which accompany it, one would have expected a chapter entirely devoted to it.

Three chapters on respiration and its disturbances are full of sound writing, but a little spoiled by a very inadequate final paragraph on breath sounds, which should either have been much amplified to show the anatomical and physiological mechanism at work or omitted altogether.

The chapters on diet and physiological principles in feeding are excellent. Of especial interest are those tables given by R. D. Lawrence showing "the food and calorific consumption of three normal persons".

The chapter on vitamins is as up to date as it is possible for any such chapter to be; the importance of vitamin *C* in mouth infections apart from frank scurvy is not mentioned.

But to pick out small omissions (even such an important one as the omission of any mention of the mercurial diuretics) would be unfair to a book like this, which contains in its four hundred pages a mass of valuable and well arranged information. It may be read as a whole or merely used as a work of reference. The busy man who has a worrying case of pneumonia and who reads the chapter on anoxæmia and respiration will come away knowing at least something of the conflicting mechanisms at work in his patient. Fresh light on many problems may be gained by reading and grasping all that is written about acid and base equilibrium; and even medical emergencies (a much neglected field) have a chapter devoted to them. The chapter on shock, too, would be well worth rereading, although it is curious how little the old casualty clearing station method of "cooking up" has made its mark on civil practice. How often a starved, cold, trembling patient is anæsthetized on a cold table, in a cold room, preliminary to a severe operation!

The pathology of metabolism is a subject which is all too little known to the busy man, except as one of the new tests which seem to be forever appearing. Here it is set out in the simplest and most understandable language, and, as always, its significance in general practice is shown.

[1] "The Science of Signs and Symptoms in Relation to Modern Diagnosis and Treatment: A Textbook for General Practitioners of Medicine", by R. J. Stewart McDowall, D.Sc., M.B., F.R.C.P.; 1931. London: William Heinemann (Medical Books) Limited. Royal 8vo., pp. 448. Price: 21s. net.

How many practitioners would like off-hand to discuss the physiology of hormones and the menstrual cycle? Here there is a clear and up-to-date summary. Such conditions as obesity, rest and exercise and growth are matters on which a busy man may feel a little hazy; they too have satisfactory treatment.

Probably the weakest chapter of all is that on the kidney. When work on the kidney is at present so full of new facts and ideas, it is surprising to find it so baldly touched. The lack of reference to the mercurial diuretics has been mentioned; the complete omission of Epstein's name or the nephrosis conception is far more startling.

There is an excellent index and a moderately satisfactory bibliography, rather restrictedly British. There are very few misprints. This is a book to buy, to read and to use for reference.

A HANDBOOK OF MIDWIFERY AND GYNÆCOLOGY.

"SYNOPSIS OF MIDWIFERY AND GYNÆCOLOGY", by Aleck W. Bourne, is an admirable book for the student preparing for examination and a handy book of quick reference for the busy practitioner.[1]

The impression gained from its perusal is one of gratitude for the patience of teachers. It is a model of orderly numbering and lettering of paragraphs and subparagraphs and its possession should bring much comfort to the methodical student. In fact it might have been entitled "Lecture Notes of the Perfect Student".

The section devoted to midwifery consists of about 230 pages of small print, and as the writer wastes no words, it will be realized that little is omitted which the student may be required to know. A description of obstetric operations is included and the pathology of morbid conditions is adequately outlined.

The gynæcological section consists of about 200 pages and 75 drawings. The anatomy, development and malformations of the pelvic organs are described, but no account of the operations of gynæcology is given.

The writer has his own pupils in mind and sets forth his own teaching. Thus, for example, the operation of symphysiotomy is described, while pubiotomy is merely mentioned, and in the account of chronic endometritis hyperplastic cystic and "glandular" types are described as due only to chronic infection.

It is the fifth edition which now makes its appearance and new matter includes a new set of diagrams of the development of the amnion and a detailed account of the Stockholm technique for the treatment of carcinoma of the cervix.

MUSCLE CONTRACTION.

A LITTLE volume on the biochemistry of muscle, written by one who has herself taken a part in the development of the subject, presents in a simple, clear manner the trend of prevailing opinion concerning the chemical processes involved in contraction.[2] In this field, where, only a few years ago, almost everything seemed so simple and clear, uncertainty once more reigns. This has been brought about by Lundsgaard's demonstration of the fact that muscles, poisoned with iodo-acetic acid, can perform a series of apparently perfectly normal twitches in the total absence of lactic acid formation. In the early phases of tetanus normal muscle indeed becomes basic, not acid, as was thought, and a large part of the lactic acid formation occurs not during tetanus, as Meyerhof maintained, but at the end of the tetanus, so that the work of Embden and his school has after all proved to be correct. Nevertheless the energy developed in such a poisoned muscle, as measured by A. V. Hill's thermopile technique, does not differ from that of a normal muscle. It seems necessary therefore to look to the phosphagen breakdown as providing the chemical energy for muscle contraction, whilst the lactic acid seems to bring about a resynthesis of the split phosphagen. The chemistry of the glycogen breakdown into lactic acid, and the respiratory processes of muscle are treated at length. The prevalent view that carbohydrate alone is oxidized in muscle is regarded as improbable, fat and even protein being occasionally utilized. The book concludes with a brief discussion of the physical mechanism of contraction. This is the least satisfactory section. The histological evidence is really not appreciated, and the surface tension theory is discarded on the basis of A. V. Hill's calculation that the quantity of lactic acid formed during a single twitch is insufficient to produce the experimentally observed tensions in a surface tension machine; and this despite the fact that in the earlier sections of the book it is admitted that lactic acid does not directly produce contraction. A short bibliography is appended.

[1] "Synopsis of Midwifery and Gynæcology", by A. W. Bourne, M.A., M.B., B.Ch., F.R.C.S.; Fifth Edition; 1932. Bristol: John Wright and Sons, Limited. Crown 8vo., pp. 446, with illustrations. Price: 15s. net.

[2] "The Biochemistry of Muscle", by D. M. Needham, M.A., Ph.D.; 1932. London: Methuen and Company, Limited. Foolscap 8vo., pp. 174. Price: 5s. net.

Notes on Books, Current Journals and New Appliances.

THE AUSTRALIAN AND NEW ZEALAND JOURNAL OF SURGERY.

THE issue of *The Australian and New Zealand Journal of Surgery* for July, 1932, has been published. This is the first number of the second volume. It contains articles of considerable interest. The George Adlington Syme Oration, delivered by Mr. C. H. Fagge in March, 1932, at the annual meeting of the Royal Australasian College of Surgeons, is published in full. J. A. Jenkins, of Dunedin, New Zealand, contributes a practical paper on the diagnosis and treatment of stone in the ureter. Adolph Bolliger and P. N. Walker-Taylor describe the late results of unilateral uretero-intestinal anastomosis. R. Angel Money and E. Susman have a contribution on the diagnostic procedure of encephalography, with special reference to traumatic focal lesions of the brain. In the department of surgical technique, D. J. Glissan describes the use of the plantaris tendon in certain types of plastic surgery. H. C. Trumble contributes a note on the use of the lateral position in surgical operations. C. J. O. Brown describes the treatment of varicose ulcers, and H. B. Devine sigmoidectomy with preservation of natural functions. Among the case reports is an interesting account by Sir Carrick Robertson, of Auckland, of four pituitary tumours. Richard Flynn reports a univesicular hydatid cyst of the kidney. The section devoted to surgery in other countries (a section which is much appreciated by operating surgeons) contains an account of Schmieden's operation for inguinal hernia and of the serum treatment of peritonitis.

AN ATLAS OF ANATOMY.

WITH the publication of Part X Baillière's "Synthetic Anatomy" is complete.[1] Several of the parts of this work have been noted from time to time in these pages. The atlas consists of a series of transparent illustrations superimposed one on the other. The illustrations represent successive layers in the dissection of different parts of the body. They are not intended to be used independently of the usual dissections, text books and teaching methods, but merely as an aid to revision. For this purpose they will be useful. The country practitioner who has not access to the dissecting room should find this publication of value.

[1] "Baillière's Synthetic Anatomy", Parts I to XII, by J. E. Cheesman; 1932. London: Baillière, Tindall and Cox. Crown 4to., with 156 plates. Price: 42s. net.

The Medical Journal of Australia

SATURDAY, AUGUST 6, 1932.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

DIATHERMY OF TONSILS.

METHODS for the removal of tonsils are among the most fruitful sources of argument. The reason is not hard to find. Tonsillar infection, particularly in childhood, is common; every medical practitioner, in general or special practice, sees patients with enlarged or infected tonsils. The tonsils are blamed for many general infections; they are looked on as the portal of entry of certain microorganisms and may themselves be a potent septic focus. Attempts at their removal might perhaps be described as popular with the general public; if they are not actually popular, they are made so often that the public almost expects a persistent sore throat to be followed by a call to the operating theatre. Lastly, attempts at removal are so easily made that the veriest tiro may make them with impunity. Could anything be simpler? The stage is set. The chief actors are ready and willing, nay, some of them anxious, to play. The audience is on the tip-toe of expectation. The "show" goes on. As a rule the performance comes up to the expectations of the audience and the hand of applause is given. Alas! sometimes, after a space, a return season is necessary and the performance must be repeated, with at least one of the chief actors a sorry, sad and unenthusiastic player.

Not many months ago the value of the total dissection, of guillotining and of diathermy of tonsils was discussed in these columns. Certain conclusions were stated and an interesting correspondence followed. It is not intended at present to reopen that discussion, but to refer to the destruction of tonsillar tissue by diathermy. This subject is of importance in view of an article published in this journal on July 2, 1932, under the joint authorship of Dr. R. Graham Brown and Dr. J. V. Duhig. If readers of this journal have not taken special note of this article, they are advised to study it. Dr. Graham Brown and Dr. Duhig give the history of several patients whose tonsils had been treated by diathermy. Subsequent removal of the tonsillar remains by dissection was undertaken. In all the sections of the material Dr. Duhig found "an abundance of lymphoid tissue arranged in the usual way in tonsils"; "the ordinary architecture of the tonsils was not, in general, disturbed". In three instances the epithelium covering the tonsils was hyperplastic. Dr. Duhig concluded that the primary object of the diathermy had failed in all the specimens he examined. In four instances the removed tissue yielded pathogenic microorganisms. This short account of Dr. Duhig's findings is admittedly inadequate; they should be studied in the original paper and in conjunction with the clinical histories. The microphotographs published by Dr. Duhig undoubtedly support his statements.

The first conclusion is that diathermy can be used for the removal of tonsils. This has been shown by McKenzie and others; it is admitted by Dr. Graham Brown and Dr. Duhig. For what type of tonsillar infection it should be used is another matter, not to be discussed at present. If removal by diathermy is to be complete, it must be carried out by those who know the anatomy of the tonsil and who are prepared to give time to the somewhat tedious applications. This is the conclusion of Dr. Graham Brown and Dr. Duhig. It needs emphasis. Diathermy machines are being sold to all and sundry; they are even being sold to enterprising pharmacists who use them in the treatment of their customers. Many medical practitioners, with a

laudable desire to extend their knowledge and augment their clinical equipment, buy machines. Some of them embark on the treatment of tonsils, little realizing that the successful removal of a tonsil by diathermy is a difficult procedure and one that requires time and patience. Encouraged by the disappearance of the superficial part of the tonsil, they, in all good faith, give a hopeful prognosis. Such persons probably have not the manual dexterity necessary for successful pharyngeal operations, nor an intimate knowledge of the anatomy of the tonsil. They have not, therefore, the right to make even one application of diathermy to a tonsil that requires removal. If they realize the difficulties, the dangers and the requirements, they will not use diathermy, but will either use some other method, to which they are accustomed, or they will send the patient to a skilled oto-rhino-laryngologist. One correspondent has stated that "with electrical coagulation an unskilled operator will do less harm than with any other method". This should not be advanced as a reason for the use of diathermy. Until medical practitioners realize their own limitations, bad results will always occur, and surgery of the pharynx, as of any other part of the body, will be brought into disrepute. The medical practitioner who finds it necessary to consider how little harm he can do with his operative interference (properly so-called) had far better leave the field to others.

So far we have agreed with the general conclusions of Dr. Graham Brown and Dr. Duhig. We would go further. Dr. Duhig points out that "it is very difficult to decide that extirpation of the tonsil is complete if reliance is placed on the naked eye appearance of the field". In this regard it is well to remember that even experts may be mistaken. A patient is frequently told after many applications of diathermy that the tonsil has been completely destroyed and that he will suffer no further disability. Were such a patient kept under observation for a lengthy period by a follow-up system as advocated last week in these columns, cases such as those reported by Dr. Graham Brown and Dr. Duhig would be discovered before the patient suffered any serious damage.

Current Comment.

EXAMINATION OF THE TONGUE.

INSPECTION of the tongue is one of the most familiar methods of physical examination. It is probably as old as the practice of medicine, and received prominent attention from the Hippocratic school. In these days we do not bestow such minute care on its survey, nor do we attempt so ambitious a linking of the appearances seen with the alleged associated pathology as did our forefathers. But there is still much information to be gained by the use of this simple clinical method. The physician is always cautious of allowing liberty to his recently febrile patient who still retains a foul, furred tongue; the brown, dry, tremulous organ still conveys a feeling of unrest to the doctor and nurse; the wrinkled, fibrillating tongue of bulbar palsy is its own announcement of the diagnosis, and syphilis still writes a more or less familiar signature in this region of the body. Not to mention carcinoma, the tongue of pernicious anæmia is perhaps one of the most interesting, especially since the introduction of liver therapy.

But it has been left to the mechanical age that has produced so bewildering an array of engines of transport, manufacture and destruction, to devise a method of taking what a pardonable Hibernianism might describe as "finger prints" of the tongue. Photographic records are not always easy to obtain, nor are they invariably convincing. This perhaps explains why several workers have endeavoured to evolve a method by which examples of lingual pathology may be recorded and preserved. Amongst those who have undertaken such an investigation are W. H. Oatway and W. S. Middleton.[1]

These authors describe a method employing smoked paper. They apply the paper evenly to the protruded tongue (after careful drying), thus obtaining negative prints. The carbon left on the tongue may then be used to make a positive tracing upon a thin card thinly coated with shellac and allowed to become almost dry.

This method they have applied to the study of the tongue in pernicious and other forms of anæmia, in anomalies of the gastric secretion, and in various morbid states of the gastro-intestinal tract. It may be doubted whether it is worth while securing records of the lingual surface contour. Certainly a permanent tracing is obtained, but it is doubtful if this is really of much use. It would seem that the chief advantage of such a study lies in the careful observations made upon the tongues of the patients under review, a lead that perhaps might be followed by others.

Oatway and Middleton found that patients with untreated pernicious anæmia showed some degree of papillary atrophy in all cases, but this did not correspond in degree to the severity of the anæmia or of the cord changes when present. Hyperchlorhydric patients were found rarely to have smooth

[1] *Archives of Internal Medicine*, May, 1932.

tongues; more usually furrowing and coating were seen. Achlorhydrics showed smoothing of the papillæ much more frequently, and this was invariable when there was an associated anæmia. It was from amongst these patients too that complaints of sore tongue and mouth, dysphagia and dry throat were obtained. This conjunction of symptoms has recently been referred to in these pages in describing the Plummer-Vinson syndrome. It was noted particularly that normal and coated tongues were not usually associated with anæmia.

The question of improvement of the glossitis of pernicious anæmia was considered also, but the number of patients studied was small and the period of time short—only three or four months. Such observations as were made seem to show that little change took place in this time, even though the patient was adequately treated with liver. But a normal tongue was found in one patient whose treatment had not been adequate, as judged by the blood picture, hence the authors conclude that cure of the anæmia and of the glossitis are not of necessity associated.

There is a definite tendency in medical research to evoke complicated methods of investigation, and while it is unlikely that clinicians will trouble to make graphic records of their patients' tongues, it is at least stimulating to be reminded of the value of a careful survey of this readily accessible organ.

THE TREATMENT OF PEPTIC ULCER.

THE rationale of the treatment of peptic ulcer is based mainly on the belief that high gastric acidity and trauma (perhaps by roughage in the diet) are of the first ætiological importance or at least have the effect of preventing healing of an ulcer once it has developed. In most methods, therefore, a bland diet is given and efforts are directed towards the alkalinization of the stomach contents. It must be admitted that, though treatment is often successful, the precise manner in which it aids the healing of the ulcer is by no means clear; the ætiology also remains obscure.

Recently gastric mucin has been given in the treatment of peptic ulcer, primarily with the object of providing the ulcer with a protective covering. This method is discussed by Arthur J. Atkinson, who has employed it in a series of eighty-five cases.[1] Atkinson remarks that the neutralization of the gastric juice may or may not be an essential part of the treatment for peptic ulcer; but, assuming that it is necessary, it may be accomplished ideally by the oral administration of mucin, which "has a high buffer value for acid and does not disturb the body chemistry" as alkalis are apt to do. In testing the value of mucin in treatment he made careful observations of the patient's symptoms, the gastric acidity and the effects of the administration of acid. In the application of the so-called "acid test", a Rehfuss tube is passed and the stomach is emptied of its fasting contents; 200 cubic centimetres of a 0·5% solution of hydrochloric acid are then given through the Rehfuss tube; if no pain is experienced at the end of half an hour, the stomach is emptied and a further dose of hydrochloric acid is given; if this second dose does not cause pain, a third is given. A reaction to the test is evidenced by the occurrence of pain identical with that produced by peptic ulcer.

To hospital in-patients Atkinson gave a diet consisting of hourly feeds of milk and cream, from 7 a.m. to 7 p.m., and a variable amount of cereals, soft eggs or custard; mucin was given with each feed and every hour from 7.30 a.m. to 9.30 p.m. Ambulatory patients were allowed three meals a day and were given mucin, in a dose of 15 grammes, with meals, between meals, and in the evening.

Pain disappeared within two or three days in most cases, but persisted for three weeks in one case. Vomiting ceased almost immediately on the commencement of treatment. Eighteen patients were reexamined by means of X rays after treatment. In none of these had retrogression occurred, and in some radiological evidence of ulcer had disappeared. Atkinson stresses the fact that the administration of mucin gave early relief to patients who had not been relieved by other methods of medicinal treatment. He does not mention precisely the form of treatment these patients had received.

Andrew B. Rivers, Frances R. Vanzant, and Hiram E. Essex have published a note on the dangers of using impure mucin in the treatment of peptic ulcer.[1] They found that the administration of mucin sometimes relieved patients suffering from peptic ulcer and sometimes made them worse. In a search for a cause they discovered that sometimes the gastric acidity was increased by the ingestion of mucin and that some samples of commercial mucin contained a substance that stimulated gastric secretion. In its physiological action and general character this substance appeared to be identical with histamine. In one sample the quantity of secretagogue was equivalent to three milligrammes of histamine per gramme of dry mucin; therefore, a patient receiving 240 grammes of this preparation a day would also receive the equivalent of 700 grammes of histamine. These findings are interesting in view of Atkinson's finding that *"in vivo* the buffering action of commercial mucin does not vary directly with the amount of mucin fed, although it does *in vitro"*.

The ideal method of treatment for peptic ulcer has yet to be found. Possibly the mucin treatment may prove to be of considerable value, either alone or in conjunction with other methods. At the same time it must be remembered that there is a vogue at present for the use of extracts of animals' organs, to which all sorts of wonderful properties are attributed. The warning note sounded by Rivers, Vanzant and Essex is timely and should be heeded by those desirous of studying the effects of mucin.

[1] *The Journal of the American Medical Association*, April 2, 1932.

[1] *The Journal of the American Medical Association*, April 2, 1932.

Abstracts from Current Medical Literature.

DERMATOLOGY.

Superficial Glossitis and Perlèche.

N. B. ROBINSON AND M. C. MOSS (*Archives of Dermatology and Syphilology*, April, 1932) have investigated a series of twenty-two cases of perlèche in adults, which were complicated by superficial glossitis in six instances, by *erosio interdigitalis* in eight cases, by paronychia in eight, and by dermatitis of the toes in four. They found that a superficial glossitis from which *Monilia albicans* could be isolated, occurred sometimes in association with perlèche and sometimes independently. *Monilia albicans* was recovered from perlèche lesions in thirteen cases and from a number of the complicating mycotic lesions. Five other allied species, *Monilia candida, Monilia parapsilosis, Monilia krusei* and cryptococcus, were recognized amongst the cultures obtained, but it is doubtful whether they are pathogenic to man. The classification was in general confirmed by agglutinations. The cultures were made on Sabouraud's honey agar. These were purified by fishing isolated colonies and transferring them to honey agar, cornmeal agar and gelatin. The surface of the growth on the plate can be studied directly by placing the whole plate under the microscope.

Demodex Folliculorum.

S. AYRES AND N. P. ANDERSON (*Archives of Dermatology and Syphilology*, January, 1932) report seventeen cases of *acne rosacea* in which the *Demodex folliculorum* was found in moderate to large numbers, either in the pus from superficial lesions or in the dry follicular scales, whereas it was absent in thirteen consecutive cases of *acne vulgaris*. Following the use of a strong antiparasitic ointment and the daily use of soap and water, in twelve of the cases the *acne rosacea* was either improved or clinically cured in all instances. Accompanying the clinical disappearance of the lesions of *acne rosacea* there was a corresponding diminution in the number of the demodex. It is suggested that the demodex plays a definite part in the cause of *acne rosacea*.

Artificial Dentures and Lesions of the Mouth.

E. S. LAIN (*Archives of Dermatology and Syphilology*, January, 1932) has made a routine examination of the mouths of forty-five consecutive adults wearing full plate dentures, revealing that 42% had either stomatitis or glossitis. It was found that in many of these cases the condition was due to neglected oral hygiene, malocclusion or trauma caused by imperfect adaptation of the plates to the alveolar processses. In several cases, however, it was concluded that the poisonous constituents of the dental plates were the cause. Analysis of the plates in two of these cases revealed porosity with free mercury sulphide and sulphur in one and aluminium powder with a trace of zinc in the other. Macroscopical and microscopical examination of other offending plates indicated undercuring with porosity. Each of thirty consecutive adults examined whose mouth contained two or more metals of different potentialities, registered from one to forty degrees of galvanic current on the microammeter. One metallic upper plate with amalgam fillings below registered a dangerously high degree of current. A large percentage of the patients complained of symptoms such as metallic taste, burning tongue and acute dental nerve sensations, or presented visible mucous lesions adjacent to or between metallic dentures, from which it was concluded that the ætiological factors were galvanic discharges. Control experiments were made outside of the mouth with various metallic dentures immersed in buffered solution (pH 6·2 to pH 7·2).

Moniliasis and Monilads.

J. G. HOPKINS (*Archives of Dermatology and Syphilology*, April, 1932) writes of some of the lesions in which the organism, *Monilia albicans*, is frequently found. The commonly recognized forms of moniliasis, namely, the interdigital erosion, paronychia and perlèche, occur so frequently in the same persons that they are evidently merely different localizations of the same disease. Recent observations, however, have indicated that in addition to the lesions listed, which are probably due to infection by moniliæ, lesions may be caused by the reaction of sensitized areas of skin to substances absorbed from moniliæ growing in distant lesions. The term moniliids has been suggested for this condition. Many cases of oral thrush with a heavily infected gastro-intestinal tract present cutaneous lesions of the type produced by *Monilia albicans*, but in these no organism could be found by the author. A case is reported in which there were extensive lesions over the scalp, face, flexures, toes, nails and other scattered infected areas, including the mucous membrane of the mouth. Cultures made on Sabouraud's honey agar from various sources, such as the circumoral dermatitis, oral mucosa and stools, proved positive for *Monilia albicans*. The serum agglutinated *Monilia albicans* in a dilution of one in 160. The cutaneous lesions could be reproduced by the intracutaneous injection of sterile extract of moniliæ, but not by other fungi. A focal reaction in the skin lesions followed a local reaction to Sabouraud's injection of monilia vaccine in an increased dose after a four weeks' attempt at desensitization. The author regarded most of the manifestations on the skin as in the nature of a moniliid, owing to the repeated failure to demonstrate the monilia in most of the cutaneous lesions and as due to the heavily infected intestinal tract. The patient, a child, greatly improved after taking a diet similar to that used in tropical sprue; its abandonment was followed by a relapse.

UROLOGY.

Urinary Infections.

L. SAS AND E. SZOLD (*British Journal of Urology*, September, 1931), from a consideration of 132 cases of urinary tract infections and a review of the literature, come to the following conclusions: (i) The reaction of urine and bacteriuria are interdependent. (ii) When infection is due to urea-splitting organisms, reaction is secondary to degree of infection. (iii) When the hydrogen ion concentration of the urine is within physiological limits the microorganisms in the urine depend on its actual reaction. (iv) The authors believe therapeutic alteration of urinary reaction to be justified.

Urethrography.

B. H. V. MOHRMANN AND H. STRAUSS (*Münchener Medizinische Wochenschrift*, October 2, 1931) have employed contrast drugs and X rays to detect the presence of urethral strictures, diverticula and affections of the paraurethral glands. Fifteen to twenty cubic centimetres of a solution of "Abrodil" are slowly injected, and as an antiseptic 0·25‰ oxycyanide of mercury is added to the solution. For lesions in the anterior part of the urethra the penis, when filled, is held parallel to the plate, but for radiograms of the entire tract a semi-lateral position with retraction of the legs is essential. The article is illustrated with pictures of various lesions.

Operative Treatment of Epididymitis.

MORE radical operation for extensive epididymovasitis is recommended by B. W. Turner (*Journal of Urology*, March, 1932). The author's operation is described. He claims that, while it conserves the function of the epididymis and vas, it conforms to the general surgical principle of free drainage for suppurative areas. Since practising this operation, he reserves epididymectomy for tuberculosis or fibrous occlusion of the whole epididymis with painful testis.

Cystometry in Urinary Incontinence.

IN further cystometric studies, D. K. Rose (*Journal of Urology*, February, 1932) describes cases of incontinence of urine. He concludes that "neurogenic bladders" are of various types and require individual study for precise diagnosis and successful treatment. With regard to prostatic obstruction, he believes that the varying physiological effects of obstruction are best studied by cystometry and

that in many cases minor forms of surgery are ultimately harmful. Complete removal of the obstruction is indicated in all but a few cases.

Obstruction of the Vesical Orifice.

MEREDITH CAMPBELL (*Journal of Urology*, February, 1932) describes a "trigonal curtain" obstructing the internal urinary meatus of an infant sixteen months old. She came under observation on account of chronic pyuria. Cystoscopically the trigone was found to be redundant and this was demonstrated by cystogram. At operation a mucosal fold two centimetres high was found lying transversely between the urethral and ureteric orifices and was large enough to obscure the head of an indwelling de Pezzer catheter. This acted as a flap valve. The redundant mucosa was excised. This condition has not previously been described, and the author shows that it is a further instance of the truth of his contention that persistent pyuria requires complete urological investigation. The patient also had bilateral reduplication of the upper urinary tract, with infection of one pelvis on each side.

Excretion Urography.

E. BORS (*Zeitschrift für Urologie*, December, 1931) prefers the 40% "Abrodil" solution for intravenous urography. To the small list of contraindications which are already well known he adds secondary anæmia. The question of movement of the kidney when the exposure is made with the patient in the vertical position, has now become of great importance owing to the possibility of visual demonstration of the behaviour of the liquid content of the organ during such alteration of position. This kind of examination sheds much light on the physiology, pathology and the dynamics of the urinary tract. Normally, when the patient stands, there is a slight descent of the organ, while the liquid content is partly or completely emptied out under the influence of gravity. In judging the degree of emptying, it is useful to compare both sides of the upper part of the urinary tract, but there is a moderate degree of variation from one person to another. Mobility of the kidney in a normal sense is met with in three chief types: (i) both organs are only slightly movable, (ii) both organs are moderately movable, and (iii) one kidney, usually the right, is moderately movable, while the other is only slightly movable. By slightly movable is meant an excursion not more than the height of one vertebral body. In cases of severe chronic inflammation of the kidney, and in neoplastic diseases, retention of the normal mobility of the organ means that the pathological process has not yet penetrated the renal capsule and the perirenal fat to make attachment to the perirenal fascia. In tuberculous kidneys, with the upright position, the contrast substance is retained longer in diseased than in healthy portions; this applies especially to tuberculous cavities in the organ. In hydronephrosis, pyonephrosis *et cetera* filling and visual clarity are generally increased in the erect position. Such "paradoxical filling" is sometimes observed in horseshoe kidney. In such cases the erect position causes an increased pressure between the ureter and the anterior surface of the isthmus which usually binds the two lower poles together. Erect position exposures also indicate that one-half of a horseshoe kidney may descend in the erect position more than the other, in spite of the binding effect of the isthmus.

"Thorotrast", a New Contrast Medium.

E. MEYER (*Zeitschrift für Urologie*, March, 1932) declares, after an experience of 200 cases, that "Thorotrast" is the ideal medium for cystoscopic pyelography, cystography *et cetera*. "Thorotrast" is a very stable colloidal suspension of thorium dioxide. The radio-opacity and the non-irritating qualities of this medium are remarkable. Even if it enters the blood stream, it is non-toxic. It mixes easily and well with urine. It is very stable and will not precipitate under any conditions. At present its chief disadvantage is its cost, which is somewhat high.

Radiation for Genito-Urinary Cancer.

RADIATION therapy for genito-urinary cancer as practised at the Memorial Hospital, New York, is detailed by A. L. Dean (*The New England Journal of Medicine*, May 26, 1932). Amongst the general principles of treatment the author insists that anæmia and local infection materially lessen the efficacy of radiation. The first application of radium is the most important. It should be thorough and adequate. In the kidney, embryonal carcinoma (Wilms tumour) is best treated by external radiation followed by nephrectomy. Recurrences are less radio-sensitive. Pelvic carcinoma is not amenable to treatment by radiation on account of its deep situation, resistance and the fact that it is usually infected. Adeno-carcinoma (hypernephroma) is radio-sensitive, but irradiation may cause fatal hæmorrhage. Immediate nephrectomy followed by external irradiation is advised. Radon seeds are used for bladder papillomata which resist fulguration, and also for papillary or flat carcinomata. The author does not practise partial cystectomy. Any projecting tumour is removed by diathermy and up to fifty seeds, aggregating 100 millicuries, may be used in an effort to cure the patient at one operation. Most prostatic carcinomata were inoperable. External X radiation is first applied to the pelvis "to promote absorption of œdema by congestion". The tumour is radiated by needles or seeds inserted through the perineum at weekly intervals. The bladder is not drained. The author has only a limited experience of the application of radium by cystotomy. Penile epithelioma is most successfully treated by radium plaque, provided the growth does not exceed two centimetres in diameter and is not fixed to Buck's fascia. All others undergo partial amputation. Inguinal glands are treated later, when infection has subsided, by external radiation, and block dissection is used only when metastases are proved to be present. *Teratoma testis* is most favourable for radiation. After diminution in size, orchidectomy is performed and surface radiation is applied to scrotum, groin, pelvic and lumbar lymphatics.

Surgical Treatment of Nephritis.

IRVING SIMONS (*Journal of Urology*, April, 1932), in a review of his own cases and of an extensive literature of the surgical treatment of nephritis, sums up the prognosis in the various types of nephritis as follows: In toxic nephrosis he describes corrosive sublimate and eclmaptic kidneys. (*a*) In corrosive sublimate kidneys unilateral decapsulation should be attempted. In all recorded cases the patients suffered from oliguria or anuria before operation, but 25% recovered. No patient submitted to bilateral decapsulation recovered. (*b*) In eclamptic kidneys convulsions, uræmia, oliguria and anuria were the indications for decapsulation after abortion or parturition without improvement. Of the patients 90% recovered. In acute glomerulo-nephritis the patients mostly suffered from acute uræmia after infectious disease, and all seemed hopeless. "These cases of acute hæmorrhagic nephritis offer an excellent field for decapsulation . . . intervention should not be delayed on account of the early age of the patient." Of the patients 81·2% recovered. In suppurative nephritis the three patients whose histories are recorded, recovered, two after nephrectomy and one after decapsulation. In chronic nephrosis 86·7% of patients recovered after unilateral or bilateral decapsulation, 76% being cured. In the lipoid nephrosis group there were two patients only. They had been "given up" by internists and the diagnosis was proven by dropsy; the patients were apparently cured by decapsulation after three years and three months respectively. Chronic diffuse glomerulo-nephritis (with oliguria and uræmia) is not a good field for surgical operation. Of five patients treated by decapsulation one was cured, two were improved and two died. One patient with massive nephritic hæmorrhage was treated by nephrectomy and seven by decapsulation. All recovered with blood transfusion. In *nephritis dolorosa* the records are unsatisfactory, but of those patients in whom decapsulation was performed nearly 90% were relieved. Degeneration of the pedicle is mentioned. Of patients suffering from nephralgia with slight hæmaturia, 80% were cured, 20% were improved by decapsulation with or without nephrotomy or nephropexy.

British Medical Association News.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been elected a member of the New South Wales Branch of the British Medical Association:

McDermott, Charles Alfred, M.B., B.S., 1928 (Univ. Sydney), 53, Brook Street, Coogee.

Post-Graduate Work.

POST-GRADUATES COURSES IN MELBOURNE.

THE annual refresher course arranged by the Melbourne Permanent Post-Graduate Committee will, as announced in the issue of May 7, 1932, be held from November 7 to 19, 1932. The Committee has arranged with Dr. C. H. Kellaway, Director of the Walter and Eliza Hall Institute, Melbourne, to deliver a series of six lectures on "The Applied Physiology of Some Medical and Surgical Problems". The syllabus of the lectures is as follows.

Lecture 1.—"Acidæmia and Alkalæmia": The maintenance of neutrality, causes of disturbed balance, and the principles of treatment.

Lecture 2.—"Shock": The regulation of the capillary circulation, traumatic shock and allied conditions, their cause and treatment. Other forms of shock.

Lecture 3.—"Anoxæmia and Cyanosis": Definitions, causes of these states, the use of oxygen and carbon dioxide in treatment.

Lecture 4.—"Cardiac Failure": The nutrition of the heart. Effects of failure upon the heart itself and upon vital tissues. Principles of treatment.

Lecture 5.—"Intestinal Obstruction": Its results and their causes. The principles of treatment.

Lecture 6.—"Some Disorders of Calcium Metabolism": The importance of calcium in the body, its normal metabolism. Vitamins. Bone diseases. Tetany.

Further details in regard to these lectures will be published at a later date.

Readers are reminded that the annual course in obstetrics will be held at the Women's Hospital, Melbourne, during the same period.

Obituary.

JAMES AMESS.

DR. JAMES AMESS, whose death occurred at Melbourne on May 1, 1932, was born at Bald Hill, Victoria, in 1860. He went to school first at Saint Stephen's School, Kew, and subsequently at Saint Mary's School, North Melbourne. At Saint Mary's School he studied under the late Percy Walker, and while preparing for the Matriculation Examination he acted as a teacher in the school. He studied medicine at the University of Melbourne and qualified in 1885. During his course he did a good deal of coaching. He first of all practised at Tungamah. He then went to Melbourne and started practice at Richmond. While he was at Richmond he was elected a member of the Richmond Council and acted as the Council's representative of the Metropolitan Board of Works. He left Richmond on account of ill-health and went to Japan for an extended trip. After his return he was appointed Medical Superintendent of the Melbourne Hospital and held this position for eight years. He subsequently returned to Richmond. During the war he served at Broadmeadows Camp, where he contracted a serious illness. He was a keen golfer and was a member of many racing clubs.

FREDERICK DELL HAYMAN.

DR. FREDERICK DELL HAYMAN, whose death was announced in the issue of July 2, 1932, was born at Axminster, Devon, in 1853. His family was one devoted to medicine, and he represented the fourth generation to enter the profession. He studied medicine at Saint Bartholomew's Hospital and qualified in 1875. He held a resident post at the Metropolitan Free Hospital. In 1876 he came to Australia and commenced practice at Edenhope; he remained there for ten years. After practising in other country towns, he visited England in 1897, where he married. After his return to Australia he practised at Ararat until his retirement in 1919. He will be remembered for his unfailing courtesy, kindness and generosity by those amongst whom he worked.

Dr. F. J. Bonnin writes:

Frederick Dell Hayman, M.R.C.S., who passed on June 23, 1932, after a tedious and trying illness at his home in Sandringham, became known to me at Ararat in 1902, and from 1905 to 1919 we practised together there. I was attracted to him from my first acquaintance by his frank manner and genial personality, and throughout the years one learned to know better his high ethical standard in relation to his patients and fellow practitioners. He was unassuming as to his attainments and always ready to help in times of trouble and difficulty. He was interested in the welfare of the profession apart from his personal practice, and when a subdivision of the British Medical Association was first formed in Wimmera in 1913 he was unanimously voted to the position of President, which he held for several years. Throughout his long term of practice he showed such an estimable example of goodwill and readiness to give and take in the exigencies of professional business that through him very largely Ararat enjoyed the most harmonious relations between its medical practitioners. In private life his hobby was his garden, and he was a strong supporter of the Anglican Church.

He was in spirit an ethical gentleman of whose character the profession might reasonably be proud, and whose passing we all sincerely regret.

JAMES WILLIAM FLORANCE.

WE regret to announce the death of Dr. James William Florance, which occurred on July 21, 1932, at Mooroopna, Victoria.

ALBERT LINDOW.

WE regret to announce the death of Dr. Albert Lindow, which occurred on July 21, 1932, at Strathfield, New South Wales.

FREDERIC REGINALD EDWARD DUKE.

WE regret to announce the death of Dr. Frederic Reginald Edward Duke, which occurred on July 24, 1932, at Holbrook, New South Wales.

Correspondence.

THE SURGICAL INFECTIONS.

SIR: By your leave I would discuss the subject so ably reviewed under "Current Comment" in your issue of even date, if only to maintain continuity of my endeavour to establish a clearer conception of the problems of infections, especially those of pyogenic origin.

I am glad that putrefactive infection has recognition as a distinct class. We must not neglect also its influence in complicating the later stages of ordinary pyogenic affections. Of this more later.

The article states that pyogenic infections may be local or general and that the form taken depends very largely on tissue resistance. This is rather begging the question. To my way of thinking, tissue resistance is a constant of high potency. It has risen above and become proof against the energy of common infective agencies. It thus becomes a more or less accurate measure of virulence. A big factor in virulence is dose. An organism that is able, within a short space of time, to set up acute invasive onslaught, has acquired its cytolytic power recently from another host of the same species, and a close humoral relation at that. Here the tables are turned.

A general lowering of resistance is a simple conception, but one uncommonly met with. The will to live and to survive is the last attribute any cell loses.

I feel that I am on less speculative ground in dealing with local pyogenic infections. Let us review the pathology and treatment of abscess as taught today. There appears to be some confusion of ideas which may be quickly dispelled. For instance, in Muir's "Text-Book of Pathology", 1924, we read: "When suppuration ceases to spread, there occurs at the periphery an active proliferation of the connective tissue cells, with new formation of blood vessels; in other words, a zone of granulation tissue forms around it, and this becomes denser in its outer part, and thus constitutes a definite wall to the abscess—the so-called pyogenic membrane" (page 102). This "membrane" forms after pus has ceased to spread, hence the name. Again: "Granulation tissue is formed also around collections of pus so as to constitute an abscess wall . . ." (page 133).

The most recent example I can quote which is in conformity with this teaching is found in "The Medical Annual", 1932, at page 115. What I quote reaffirms a fundamental principle in the first place, and, in the second place, a fundamental error. "To wait until pus arising from dental origin has subsided is surely contradictory to all the teaching of surgical pathology. The formation of granulation tissue as a definite stage in the process of repair cannot be formed before the pus is removed or absorbed." We must let the construction pass, but not the pathology.

From these statements we must conclude that pus forms first and that granulation tissue comes after, which is the reverse of what happens. Pus is the child of irritated granulation. When will we all understand that the formation of granulation tissue is the first effort at repair? In "Current Comment" this fact is clearly put in the following words: "In local infections there occurs a reaction in the tissues, consisting chiefly of hyperæmia, exudation, and, finally, a protective proliferation, with round cell infiltration, taking its origin from the reticulo-endothelial system."

This first sign of repair, this fibroblastic envelope in embryo, this definite sign of localization of the infection which we hail with delight, is followed by pus formation, which we can confidently describe as the terminal phase of an infective process. Quick and certain cure is in sight.

With the evacuation of pus and the relief of tension the granulations lining the cavity can have no reason to form more pus or, more correctly speaking, the cells of which it consists are relieved of the conditions which broke them down in the first place. So long as the cavity is now protected from further irritation of any kind, such as chemical, physical or bacterial (secondarily introduced and usually putrefactive), all discharges except those of a scanty serous nature will cease. It is a fortunate, comforting and true statement to say that this course will follow, no matter where the abscess may be situated or in what kind of tissue it began.

We can therefore say that there is no more simple or satisfactory surgical therapeutic measure than the treatment of abscess.

Just as pleasing to surgeons is the thought that the puzzling problems referred to in the article which has prompted this letter are swept away for such further academic study as they may be judged to deserve. Treatment based on modern conceptions which are utterly erroneous must fall far short of our ideals. Hence the grotesque and inelegant innovations now attracting so much attention. From this fact alone we will cut a sad and sorry figure upon the day when we all wake up from filthy dreams of maggots marching and the stench of putrefaction.

Yours, etc.,

A. C. F. HALFORD,
M.D. (Melb.), F.R.A.C.S.

Brisbane,
July 9, 1932.

PHYSICS.

SIR: Dr. Edwards's letter in today's journal must, I am sure, interest many of your readers. Tempted by the alluring advertisement in the journal, I secured a copy of "Physics" as soon as it appeared. Apparently Dr. Edwards has read the whole book. I must confess that I have not, nay more, I cannot. Major Booth was sent to this village to report on the damage done by the tornado of February 1. As I was one of the sufferers, he had to examine my house, and I took that opportunity to try and tell him what a task it was for an ordinary general practitioner to try and understand his book, because of the large amount of higher mathematics *et cetera* contained therein. I am afraid our interview did little more than show me the great gulf between the ordinary man and the expert, and to make me humbly grateful that I had no physics examination to pass. A few years ago I taught myself ancient Egyptian, and the task of deciphering hieroglyphics is child's play compared with the labour of trying to make use of this highly specialized text book.

Yours, etc.,

J. W. SUTHERLAND.

Narromine,
July 9, 1932.

Post scriptum: Any medical society's library can have my copy *gratis* if they pay the postage.

SIR: In the last issue (ninth instant) of the journal appears a timely and well merited criticism of the modern system of teaching physics to first year medical students. Like Dr. J. G. Edwards, I have had an opportunity of "reading" the recommended text book of physics by Booth and Nicol. How a first year student can be expected in the allotted time to master the intricacies of physics, as laid down in this book, passes my comprehension. As a radiologist of many years' standing, Dr. Edwards has felt that the common sense course taught us by the late Professor Pollock, away back in the dark ages of 1905 to 1907, has sufficed for his needs in all the subsequent years. And who, more than a radiologist, amongst medical men can be in a position to evaluate better the completeness or otherwise of teaching in such a subject as physics? One cannot escape the conviction that the time is long since past when the curriculum in the Faculty of Medicine should be revised from the point of view of really practical value. Elementary biology, physics and chemistry should be compulsory subjects in the case of candidates matriculating in the Faculty of Medicine. Armed with the preparatory ground work, the student could, in his first year, have these subjects amplified to the extent found necessary by modern day requirements. But to expect an unfortunate first year medical student to assimilate the higher mathematics of physics is the height of academic idiocy. His time can well be spent to better advantage. Again, anatomy should be taught largely from the viewpoint of its surgical application, and a good deal of the teaching in physiology could with much advantage be combined with, where practicable, pathological principles. The idea of watertight compartments in the medical curriculum should be avoidable and avoided.

Continuity in teaching should be aroused and maintained throughout the course. This would, in my opinion, tend to obviate the course of "cramming". Physics, as at present taught, can lead only to intensive "cramming" and mental indigestion.

Yours, etc.,

L. M. McKILLOP.

Eagle Street,
Brisbane,
July 15, 1932.

SIR: I read Dr. Edwards's letter with approval and amusement. I also read physics of a very humble sort with pleasure, even if, like Charles Darwin, I find a kind of enjoyment in browsing on books I don't quite understand.

I confess, however, that the admirable text book in use by our medical students is, I fear, beyond the limits of casual reading. I have, however, every reason to believe that it is really a very fine work, but a large part seems to me quite beyond and needless to a medical student.

For certain other professions and for medical men devoting their lives to one or other of the scientific side-lines of medicine I can quite believe the book and the teaching given from it would be very valuable. But the future of most medical students lies in ordinary practice, and much of the work crammed up on the lines of this fine text book will be forgotten in a few months, and, even if remembered, I fear will not greatly help the doctor in his daily work in after-life.

Physics and "physical chemistry" are more and more necessary in the education of a doctor, but I cannot believe that much of what is taught to and expected of a junior student is necessary. Surely the greater part of the mechanics in the first year might be deleted. In truth it is largely a waste of time, and the curriculum is short enough indeed to cover work even more vital than the ultra-mathematical food dealt with in this admirable text book.

Yours, etc.,

R. SCOT SKIRVING.

Sydney,
July 12, 1932.

NASAL SINUSITIS.

SIR: Dr. Sydney Pern, in his letter in your issue of April 9, suggests as worthy of a trial "operation with ionization".

The original method of Friel has to my mind the objection of being applicable only to all sinuses at one time, which is generally unnecessary, together with the necessary troublesome procedure of packing off the post-nasal space.

Outlined here is a technique and results of four cases of chronic antral infection so treated, in order that others may interest themselves in this method of treatment.

In post-operative cases the affected antrum is first washed out in the usual method, using isotonic saline, followed by zinc sulphate solution (zinc sulphate fifteen grains, glycerine three drachms, *aquam* eight ounces), to be diluted at time of using with an equal quantity of warm water (Friel).

The metal post-operative or blunt curved cannula is then replaced by a similarly shaped vulcanite one—a shortened vulcanite Eustachian catheter makes an excellent one. Fixed into this cannula and projecting one-eighth inch beyond its tip is a zinc wire, the other end of which is attached to the positive pole of the galvanic current generator. The zinc wire does not fit tightly in the cannula, and so allows a constant trickle of zinc solution to be led into the antrum by means of a glass douche can and rubber tube connexion.

The patient lies with the affected side down to the pillow, so that the ostium is uppermost, thus insuring an antrum constantly full of solution, as well as being the most favourable position for the overflow.

The negative pole is either firmly held or preferably attached by a bandage over four thicknesses of saline moistened lint to an arm. This pad should be constantly moistened to insure good contact, since very low ampèrages are being passed. The current is now turned on very slowly, increasing the ampèrage to 10 to 15 milliampères, as read by the meter, the needle of which will, if there is no "shorting", remain steady.

Each sitting was 10 to 15 milliampères for 15 minutes.

My one post-operative case (a bilateral endonasal operation) was a doctor, who had both antra ionized consecutively at the one sitting. Three months later he assured me it was definitely very much better.

Pre-operative cases, whilst requiring a slight variation of the above, will be found most gratifying in their response.

The antrum is, as before, washed out, this time using the standard Lichwitz trocar and cannula. After washing out, the cannula is left in place, and introduced into it is a fine insulated zinc wire, the depth of insertion being determined by its attachment to the standard tapered nipple as supplied with the cannula. As before, the solution is constantly trickled in from a douche can, the negative pole attached, and current directed to the same strength.

Care must be taken to see that the ostium is patent, as determined by the return from the preliminary wash-out.

Three cases in this latter series have been given great relief from symptoms. In two especially was it most gratifying, since repeated lavage had failed appreciably to lessen for long a profuse fœtid discharge.

Whilst this method of treatment would seem specially suitable for the majority of cases of antral infection, those cases of a grossly polypoid nature require something more radical.

My thanks are due to Dr. Bell Ferguson, with whom I have been associated at the Central Tuberculosis Bureau, in the quest to find a method of relief for many cases wherein operation is contraindicated.

Yours, etc.,

NORMAN EADIE, D.L.O., F.R.A.C.S.

2, Collins Street,
Melbourne,
July 14, 1932.

THE NEW MEDICAL CURRICULUM OF THE UNIVERSITY OF MELBOURNE.

SIR: The new medical curriculum has now been passed by the Council and the Committee of Convocation. It has been modified in some details to meet the requirements of the General Medical Council of Great Britain. Shortly, it provides for more than two years of uninterrupted study in the basic clinical subjects, namely, medicine, surgery, gynæcology and obstetrics, and pathology. These are to be taken from the close of the third year until the early part of the sixth year, when the main examination will take place. The special subjects are then to be studied during the remainder of the sixth year. A general clinical examination is to be held at the end of that year and which includes reference to the special subjects. Time has been found for them with great ingenuity, and it is hoped that the special subjects will be dealt with in a post-graduate atmosphere. I am writing, however, to ask those concerned with medical education to give a thought to the future. There are now no less than thirteen special subjects. For the moment they can be managed and we have time to think. Other special subjects are well above the horizon and will be pressed for inclusion, namely, hydrology, climatology, more public health, psychology and special applications of biochemistry *et cetera*. It must be obvious that the length of the curriculum must bear some reasonable relationship to the normal duration of human life and that no further inclusions are practicable without encroaching on a seventh year.

As every graduate should hold the position of an intern in a hospital, he will be well into life before practice

begins even now. What, then, is to be done? I do not think the lengthening of the course can be contemplated, and some other solution must be formed.

Dr. Zwar has kindly handed me a letter from Professor P. D. Wilkie, of Edinburgh, which indicates the arrangement which will probably meet the inevitable difficulty. He agrees that as regards special subjects an attempt is being made to teach too much by specialists. He thinks that much of the special work could be included in general medicine and surgery.

I feel that general medicine and surgery will be taught more and more at the bedside and less and less by lecture, and that by this means room may be found for some of the new subjects as part of general medicine. Surely the chief though not the only object is to give the general practitioner sufficient knowledge to appreciate the nature of the evidence furnished by a specialist. Those who wish to become specialists are being provided with post-graduate diplomas issued after adequate instruction and examination.

I write in the hope that all concerned will turn the problem over in mind before the necessity for practical action is forced on us, which, in my judgement, will not be long deferred.

Yours, etc.,

JAMES W. BARRETT.

103-105, Collins Street,
Melbourne,
July 18, 1932.

"TI-TROL."

SIR: Re correspondence, "Ti-Trol", in THE MEDICAL JOURNAL OF AUSTRALIA, July 16, 1932. The reason that "Ti-trol" is more expensive than eucalyptus is that the yield of oil from the leaf is very small when compared with the yield from the eucalyptus leaf.

Additional to the smaller yield, a much greater production cost is incurred, due to the tea tree which produces "Ti-trol" being a swamp growth, and labour conditions do not compare with those prevailing in the production of eucalyptus. The superiority of "Ti-trol" over eucalyptus oil is that its Rideal-Walker germicidal coefficient is two to three times as great as that of eucalyptus, with the additional properties of being non-toxic and non-irritant.

Medical reports received over the past three years indicate that "Ti-trol" is doing work which cannot be done by eucalyptus, and we are prepared to forward to your correspondent a booklet of medical data and reports concerning the use of "Ti-trol". If necessary, we will put him in touch with practitioners who have considerable experience with "Ti-trol" and are able to give detailed comparative statements.

Yours, etc.,

H. JAMES,
Managing Director,
Australian Essential Oils, Limited.

115, Pitt Street,
Sydney,
July 19, 1932.

PHARMACISTS USING DIATHERMY.

SIR: A young man, aged twenty-seven, recently married, and wife soon to be delivered, recently consulted me on account of a tumour in the middle of his back, the history being that he had a mole on his back to which a pharmacist in the country applied diathermy. The tumour, when he saw me, was growing rapidly and surrounding the main part were small satellites. Although the whole area was widely excised by a surgeon, yet the poor fellow is in more probability doomed, so well known are the terrible effects of melanotic sarcoma.

Since then I was requested by a pharmacist in the city to help him by referring to him cases for diathermy, as he had just put in a machine. And this week I was told of a pharmacist in the suburbs who applied to a medical man to give an anæsthetic for him while he diathermied some warts on a client.

How many other pharmacists are using diathermy and "treating" by other means? For an unqualified man to attempt to treat something he knows nothing about, with a machine (or anything else) he most probably knows nothing about, a machine which, except in expert hands, can be a most dangerous one, is surely sufficient reason to stop it by legislation at once before any more good lives are wasted or serious burns result.

Another point I would like to be noted is the "Yankee" methods adopted by some firms who sell medical apparatus, who, with their gullible talk, try and, alas, often succeed in selling apparatus, whereas only those familiar with and properly trained in their use and dangers should use them.

The remedy to me to prevent all this is for the British Medical Association to interview the Minister for Health and point out the dangers of unqualified persons, pharmacists, quacks, herbalists, so-called "biochemists" and institutes for "this and that", "professors", *et cetera*, treating maladies, and to press for him to prepare a bill for consideration of Parliament to pass into law. Surely, if it is a crime for a pharmacist or anybody else to treat venereal disease, it is a crime for a pharmacist or anybody else to, shall I say, kill a young man with diathermy.

As regards the firms selling medical apparatus, some form of registration with the British Medical Association could be adopted so that that body could in some manner control their method of selling and advertising.

Yours, etc.,

GEORGE R. HAMILTON.

147, Macquarie Street,
Sydney,
July 20, 1932.

Proceedings of the Australian Medical Boards.

NEW SOUTH WALES.

THE undermentioned have been registered pursuant to the provisions of *The Medical Act* of 1915, of New South Wales, as duly qualified medical practitioners:

Broome, Gerald Douglas, M.B., B.S., 1923 (Univ. Melbourne), Royal South Sydney Hospital.
Fothergill, William Lewis, M.B., Ch.M., 1925 (Univ. Sydney), Darwin, Northern Territory.
White, Salome Jean, M.B., B.S., 1929 (Univ. Melbourne), Crown Street Women's Hospital, Sydney.

QUEENSLAND.

The undermentioned has been registered pursuant to the provisions of *The Medical Act* of 1925, of Queensland, as a duly qualified medical practitioner:

Dittmer, Felix Cyril Sigismund, M.B., B.S., 1930 (Univ. Sydney), Proserpine.

THE ROBERT H. TODD PRIZE IN MEDICAL JURISPRUDENCE.

ADDITIONAL subscriptions towards the Robert H. Todd Prize in Medical Jurisprudence have been received as follows:

£5 5s.: Dr. A. A. Palmer.
£3 3s.: Dr. R. B. Wade.
£2 2s.: Dr. Andrew Davidson.
£1 1s.: Dr. F. C. Crossle, Dr. Hugh Hunter, Dr. R. V. Storer.
10s. 6d.: Dr. A. W. D'Ombrain.

Books Received.

DISEASES OF THE CORONARY ARTERIES (MYOCARDITIS), by D. C. Sutton, M.S., M.D., and H. Lueth, Ph.D., M.D.; 1932. St. Louis: The C. V. Mosby Company. Super Royal 8vo., pp. 163, with illustrations. Price: 32s. net.

THE BOOK OF TEA: A JAPANESE HARMONY OF ART, CULTURE AND THE SIMPLE LIFE, by O. Kakuzo, with appendix by A. L. Sadler, M.A.; 1932. Australia: Angus and Robertson, Limited. Crown 8vo., pp. 102. Price: 3s. 6d. net.

CLIO MEDICA: A SERIES OF PRIMERS ON THE HISTORY OF MEDICINE, Edited by E. B. Krumbhaar, M.D.: Part VII: Medicine among the American Indians, by E. Stone, M.D.; 1932. New York: Paul B. Hoeber. Foolscap 8vo., pp. 139, with 17 illustrations. Price: $1.50 net.

POCKET MONOGRAPHS ON PRACTICAL MEDICINE: ALLERGY, by G. H. Oriel, M.A., M.D., with foreword by H. W. Barber; 1932. London: John Bale, Sons and Danielsson, Limited. Foolscap 8vo., pp. 87. Price: 2s. 6d. net.

ELEMENTARY HYGIENE FOR NURSES: A HANDBOOK FOR NURSES AND OTHERS, by H. C. Rutherford Darling, M.D., M.S., F.R.C.S., F.R.F.P.S.; Fifth Edition; 1932. London: J. and A. Churchill. Crown 8vo., pp. 326, with 58 illustrations.

A SHORT PRACTICE OF SURGERY, by H. Bailey, F.R.C.S., and R. J. McN. Love, M.S., F.R.C.S.; Volume I; 1932. London: H. K. Lewis and Company, Limited. Demy 8vo., pp. 538, with 269 illustrations, of which 17 are coloured. Price: 20s. net.

OLD BELIEFS AND NEW KNOWLEDGE: THE BASIS AND DEVELOPMENT OF RELIGION, by W. Russell, M.D., LL.D.; 1932. London: John Bale, Sons and Danielsson, Limited. Crown 8vo., pp. 286.

CLINICAL INTERPRETATION OF LABORATORY REPORTS, by A. S. Welch, A.B., M.D.; 1932. Philadelphia: P. Blakiston's Son and Company. Demy 8vo., pp. 380, with 16 illustrations and a frontispiece in colour.

CANCER: CIVILIZATION: DEGENERATION, by J. Cope. London: H. K. Lewis and Company, Limited. Super royal 8vo., pp. 310, with 55 illustrations. Price: 15s. net.

Medical Appointments.

Dr. A. Hinchley has been appointed District Medical Officer, Cue, Western Australia.

* * *

Dr. F. V. Munro (B.M.A.) has been appointed Government Medical Officer at Gloucester, New South Wales.

* * *

Dr. E. W. Gault (B.M.A.) has been appointed, pursuant to the provisions of the *Workers' Compensation Act* 1928, to be Certifying Medical Practitioner at Surrey Hills, Victoria.

* * *

Dr. Frank H. Beare (B.M.A.), Dr. D'Arcy R. W. Cowan (B.M.A.) and Dr. Harry W. W. Wunderly (B.M.A.) have been appointed Honorary Physicians to the Bedford Park Sanatorium, South Australia.

* * *

Dr. H. Keith Pavy (B.M.A.) has been appointed Officer of Health at Lucindale, South Australia.

* * *

Dr. F. C. S. Dittmer (B.M.A.) has been appointed Government Medical Officer at Proserpine, Queensland.

* * *

Dr. Hector Hamilton Stewart (B.M.A.), of Perth Hospital, has been appointed a Justice of the Peace for the Perth Magisterial District.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xvi.

LAUNCESTON PUBLIC HOSPITAL, TASMANIA: Resident Medical Officer (male).

ROYAL NORTH SHORE HOSPITAL OF SYDNEY, NEW SOUTH WALES: Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associated Friendly Societies' Medical Institute. Mount Isa Mines. Toowoomba Associated Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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